BRITISH DENTAL JOURNAL

VOL. XC, No. 5 MARCH 6, 1951

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March 6, 1951

BRITISH DENTAL JOURNAL

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(Incorporating the "Mouth Mirror" and the "Dental Gazette")

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Orders and remittances for advertisements must reach the Journal Manager at 13, Hill Street, Berkeley Square, London, W.1, at least 11 days before publication date. **Advertisements cannot be accepted by telephone.**

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In no circumstances will this information be divulged by this office. Telephone messages for transmission to advertisers under Box Numbers cannot be accepted.

Members are requested before applying for any public dental appointment advertised in the lay Press to communicate with The Secretary, 13, Hill Street, Berkeley Square, London, W.1.

ANNUAL EXAMINERSHIPS

ROYAL College of Surgeons of England. Faculty of Dental Surgery. The Board invite applications for the following ANNUAL EXAMINERSHIPS for submission to the Council of the College: For the Licence in Dental Surgery. *Associate Examiners (who must be engaged in teaching students the properties of dental materials and practical dental mechanics). Number to be elected, 2; number who seek re-election, 1. †Associate Examiners (one teacher of General Anatomy). Number to be elected, 1; number who seek re-election, 1. †Associate Examiners (one teacher in Physiology). Number to be elected, 1; number who seek re-election, 1. For the Fellowship in Dental Surgery. Examiners for the Primary Examination: †Anatomists. Number to be elected, 2; number who seek re-election, 2. †Physiologist. Number to be elected, 1; number who seek re-election, 1. †Pathologist. Number to be elected, 1; number who seek re-election, 1. *Dental Surgeons. Number to be elected, 4; number who seek re-election, 4.

*Candidates must be registered under the Dentists Acts.

†Candidates must hold a medical qualification registrable in this country.

Forms of application can be obtained from the Secretary of the Faculty, and these must be completed and returned by Tuesday, March 27, 1951. W. F. Davis, Secretary. Lincoln's Inn Fields, W.C.2.

FELLOWSHIPS AND SCHOLARSHIPS

NUFFIELD Foundation. Fellowships and Scholarships in Dentistry. The Nuffield Foundation invites applications from citizens of the United Kingdom, for Fellowships and Scholarships in Dentistry. To help the advancement of teaching and research on dental health and disease, the Foundation is prepared to award a number of FELLOWSHIPS: (i) to enable selected men and women with dental qualifications to receive such additional training in pure and applied science as is desirable to fit them for an academic career in dentistry, and (ii) to enable selected university graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease. The Foundation is also prepared to award a limited number of SCHOLARSHIPS to assist students of outstanding ability attending a university dental school to devote one or two years to further studies of the basic sciences. Applications for fellowships should be received by March 1 annually and for scholarships by June 30 annually. Copies of the conditions of both fellowships and scholarships and the application forms are obtainable from the Secretary, Nuffield Foundation, 12/13, Mecklenburgh Square, London, W.C.1. L. Farrer-Brown, Secretary of the Nuffield Foundation.

COURSES

SALISBURY Group Hospital Management Committee. Park Prewett Group Hospital Management Committee. A course for the Final Examination for the Fellowship in Dental Surgery, Royal College of Surgeons of England, will be held under the auspices of the above Committees, at the Plastic and Oral Surgery Centres at Odstock Hospital, Salisbury, and Rooksdown House, Park Prewett Hospital, Basingstoke, as follows: April 30—May 5, Rooksdown House; May 7—May 11, Odstock Hospital. The number of applicants will be limited and preference will be given to those who have passed the Primary Examination for the F.D.S. R.C.S.(Eng.). The fee for the combined course will be £8 8s. 0d. Syllabus, details of accommodation, and forms of application, may be obtained from either the Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts, or the Secretary, Park Prewett Group Hospital Management Committee, Park Prewett Hospital, Basingstoke, Hants.

WESTMINSTER Medical School (University of London). Postgraduate course in Oral Surgery and Exodontia on Tuesdays and Fridays from 9.30 to 12 noon, from April 24 to July 13 inclusive, in the Dental Department, Westminster Hospital. Fee 10 guineas. Students limited to six. Applications to the Secretary, Westminster Medical School, Horseferry Road, S.W.1. Fees not returnable unless at least three weeks' notice of withdrawal is given.

PUBLIC APPOINTMENTS

MANCHESTER Regional Hospital Board invite applications from qualified dental practitioners of high professional standing for the following two posts of CONSULTANT DENTAL SURGEON to: (i) Salford, West Manchester, North Manchester, Oldham and Ashton Groups of Hospitals; (ii) Wigan, Preston, Blackpool, Lancaster and Barrow Groups. Consultative Clinics will be held at one hospital in each Group and the Dental Surgeon will have the use of beds as required. Applicants must possess, in addition, either a medical qualification or a higher qualification in dental surgery. The appointment may be held on a whole-time or part-time basis (maximum sessions). Salary £1,700 to £2,750 whole-time; part-time, pro rata. Posts superannuable; national terms and conditions of service applicable. Application forms, obtainable from the Senior Administrative Medical Officer, No. 1 North Parade, Parsonage Gardens, Manchester 3, should be returned, together with the names and addresses of three referees, not later than March 31, 1951. Canvassing will disqualify.

ROYAL Dental Hospital of London School of Dental Surgery (University of London), Leicester Square, W.C.2. The Council are to appoint an ASSISTANT DIRECTOR of the PARODONTAL DEPARTMENT (full time) from September 1, 1951. The successful candidate will be required to undertake undergraduate teaching, to assist in the conduct of post-graduate courses, and prosecute research. Salary: £1,500 x £100—£2,000 per annum according to qualifications and experience, together with superannuation under the F.S.S.U., and family allowance if eligible. Candidates, who must possess a registrable dental qualification, should forward 6 copies of their application and the names of 3 referees not later than March 31, 1951.

SOUTH Manchester H.M.C. Wythenshawe Hospital, Wythenshawe, Manchester. Applications are invited for the post of SENIOR HOUSE OFFICER (Dental) to the Dental Unit at the above Hospital. The post is suitable for experience for the Fellowship, resident and subject to Ministry of Health conditions of service. Salary £670 per annum less deduction in respect of residential emoluments. Applications, stating age, qualifications, present post, previous appointments and names of two referees to be forwarded to the undersigned not later than March 16, 1951. A. H. Keates, Secretary to the Committee, Christie Hospital and Holt Radium Institute, Manchester, 20.

OXFORD Regional Hospital Board. Applications are invited from registered dental practitioners for the post of ASSISTANT DENTAL SURGEON to the hospitals of Aylesbury Hospital Management Committee and primarily to the Royal Buckinghamshire Hospital, Aylesbury, and St. John's (Mental) Hospital, Stone. The appointment will be for 4 notional half days a week but may be extended and the salary will be on the scale for a Senior Hospital Dental Officer in the National Health Service. Canvassing will disqualify, but applicants are invited to visit the hospitals by arrangement. Applications (9 copies) stating age, qualifications, experience and the names of 2 referees should reach the Secretary of the Board (from whom further particulars may be obtained), 43, Banbury Road, Oxford, by March 16.

THE University of Manchester. Turner Dental School. Applications are invited for the following whole time posts: DEMONSTRATOR in ORTHODONTIA; DEMONSTRATOR in PREVENTIVE DENTISTRY. Initial salary £670 per annum. Membership of the F.S.S.U. and Children's Allowance Scheme. Applications should be sent not later than April 30, 1951, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

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LONDON, W. Good-class practice with unlimited scope for N.H. work, conducted in lock-up suite, main road corner position, serving good-class residential quarter and business areas of West End. Mostly conservative work at present.

SURREY. Good middle-class old established practice for disposal in very nice residential district. Pre-N.H. takings about £3,000 per annum. House specially built in 1936, well appointed for both professional and living purposes; excellently situated. Modern equipment. Scope for expansion. Terms to suit buyer.

EAST MIDLANDS. Old established practice in residential areas on outskirts of city, conducted in freehold house with living accommodation. Plenty of scope for more N.H. work. Vendor moving south for family reasons.

LEICESTERSHIRE. Death vacancy in old established practice. Pre-N.H. takings averaged over £2,000 per annum. House with living accommodation, to rent. Goodwill £1,000; payments accepted over a period.

LONDON, N. Owner of old-established family practice wishes to go abroad this year. Gross prior to N.H.S. £3,000 per annum. Definite scope for expansion in N.H. work. Well appointed practice and freehold house.

READING. Death vacancy in old established practice conducted in lock-up premises on suitable lease. £1,000 for practice, equipment, waiting-room furniture, work in hand, etc.

S. RHODESIA. Half-partnership offered in established practice. 2 surgeries; equipment all new, including Unit X-ray, etc. Receipts for first half of 1950 over £4,500. Further information upon application.

CORNISH Coast. Old established practice with professional and living accommodation on premises. Also a house by sea if desired. Goodwill and equipment £4,000; payments to suit buyer.

HOME COUNTIES. Long established practice for sale. 3 well appointed surgeries, offices, workshops, as well as ample living accommodation on long lease at reasonable rental. High-class private and N.H. patients. Suit two partners.

SOUTH COAST. Death vacancy. Qualified practice conducted in present house for some years; ample scope for N.H. work. With or without living accommodation.

N. RHODESIA. Dental surgeon with two busy practices wishes to visit England this year. Would like to hear from dental practitioner in England who would like to visit Africa. Exchange of practices preferred.

ROYAL Dental Hospital of London School of Dental Surgery (University of London), Leicester Square, W.C.2. Applications are invited for the posts of (a) DEMONSTRATORS in OPERATIVE DENTAL SURGERY; (b) DEMONSTRATOR in OPERATIVE DENTAL SURGERY (Phantom Head Class); (c) DEMONSTRATORS in the PROSTHETICS DEPARTMENT. 5 sessions each week. Salary: Not less than £600 p.a. x £50 to £750 p.a. Superannuation under the F.S.S.U. and family allowance may be considered. Morning sessions commence at 9 a.m.; afternoon sessions commence at 2 p.m. The appointments will be tenable in the first instance to August 31, 1951, and thereafter will be subject to annual re-election. Candidates, who must possess a registrable dental qualification, should forward 6 copies of their application and the names of 3 referees to the Dean not later than March 31, 1951.

PLYMOUTH, South Devon and East Cornwall General Hospital Group. South Devon and East Cornwall Hospital, Greenbank Road, Plymouth. Applications are invited from registered dental practitioners for the appointment of DENTAL HOUSE SURGEON, first post, vacant May 11, 1951, including practitioners within three months of qualification who are liable for service under National Service Acts. This post is recognised by the Royal College of Surgeons as fulfilling the requirements of candidates for the Fellowship in Dental Surgery. If held by a practitioner who is liable under these Acts, the appointment will be for a period of six months. Salary and conditions of service in accordance with the National Health Service terms. Applications, together with copies of three recent testimonials, should be sent to the undersigned by March 26, 1951. Arthur R. Cash, Secretary, Head Office, Greenbank Road, Plymouth.

TUNBRIDGE Wells Group Hospital Management Committee, Queen Victoria Hospital Jaw Injuries Unit, East Grinstead. Applications are invited for the post of DENTAL HOUSE SURGEON. The post, which is tenable for six months, is resident, and the salary in accordance with the scale for House Officers. The post is recognised for the Fellowship in Dental Surgery of the Royal College of Surgeons. Applications in writing, together with copies of recent testimonials, should be sent to the Senior Administrative Officer at the Hospital.

HIS MAJESTY'S Colonial Service. DENTAL SURGEON required in Tanganyika to treat patients of all races and to assist, if required, in teaching Africans. Appointment will be on 2 years' probation for permanent and pensionable employment. The salary scale ranges from £865 a year to £1,590 a year, the point of entry depending upon age and experience. Where Government quarters are provided, 10 per cent of salary is deducted as rent. Free passages granted in both directions. Income tax is very low. Tour of service two to three years. Generous home leave. Social and recreational amenities are good. Secondment from the National Health Service can be arranged for period up to six years without loss of superannuation rights and the payment, on reversion to the National Health Service, of a resettlement grant of 20 per cent of the aggregate of salary during the period of secondment. Candidates should have dental qualifications registrable in the United Kingdom. Application forms can be obtained from the Director of Recruitment, (Colonial Service), Colonial Office, Sanctuary Buildings, Great Smith Street, London, S.W.1.

COUNTY of Leicester. Applications are invited for posts as SCHOOL DENTAL SURGEONS (Male or Female) on a salary scale of £900 per annum, rising by annual increments of £25 to £1,100 per annum. The Council will adopt the Award of the Industrial Court as and when published. The posts will be permanent and subject to the Local Government Superannuation Act, 1937. Forms of application, including terms of service, may be obtained from me, and should be completed and returned not later than March 27, 1951. John A. Chatterton, Clerk of the County Council. County Offices, Grey Friars, Leicester.

METROPOLITAN Police Dental Clinic. Applicants invited for appointment as DENTAL SURGEONS at the Dental Clinic, 109, Lambeth Road, S.E.1. Salary £900 x £35—£1,500 (according to age and experience). Superannuation arrangement under N.H.S. Regulations. Application form and terms of appointment from Secretary (Room 163), New Scotland Yard, S.W.1.

LANCASHIRE County Council. School Health Service. SCHOOL DENTAL OFFICERS. Applications are invited from registered Dental Surgeons for the following vacancies: 1. Accrington B.; 2. Eccles B.; 3. Failsworth U.D. and Crompton U.D.; 4. Irlam U.D. and Urmston U.D.; 5. Littleborough U.D., Milnrow U.D., Royton U.D. and Whitworth U.D.; 6. Nelson B. and Padiham U.D.; 7. Rishton U.D., Oswaldtwistle U.D. and Blackburn R.D.; 8. Newton-le-Willows U.D. and Haydock U.D. Salary £810 x £50—£960 p.a., plus interim annual bonus of £200. Travelling and subsistence allowances where applicable. Posts superannuable. Application forms with further particulars from County Medical Officer, School Health Department, County Offices, Preston.

COUNTY Borough of Brighton—Education Committee. Applications are invited from registered Dental Surgeons for appointment as ASSISTANT SCHOOL DENTAL OFFICERS. Salary £800 per annum rising annually by £50 to £1,100 per annum inclusive. Initial salary within the scale according to experience. Salary scale will be revised in accordance with the national agreed scale when fixed. Further particulars and form of application may be obtained from the Education Officer, 54, Old Steine, Brighton, to whom applications must be sent within two weeks of appearance of advertisement. J. G. Drew, Town Clerk, Brighton.

RADNORSHIRE County Council. Appointment of County and School Dental Officer. Applications are invited from Dental Surgeons for the post of COUNTY and SCHOOL DENTAL OFFICER to the Radnorshire County Council. The candidate appointed, who will work under the direction of the County Medical Officer, will be entirely responsible for the Council's Dental Service which covers inspection and treatment of pupils attending the Authority's maintained schools and the dental care of mothers and young children under the National Health Service Act. The salary is £780, rising by annual increments of £30 with a final increment of £20 to £980 per annum. The commencing salary within this scale will depend upon the candidate's previous experience. The salary will be adjusted to conform to any nationally agreed salary scale for whole-time Public Health Dental Officers. Travelling and subsistence allowances will be paid in accordance with the Council's scale. Forms of application with particulars of the duties and conditions of appointment may be obtained from the County Medical Officer, County Hall, Llandrindod Wells, to whom completed forms should be returned as soon as possible.

DEVON County Council Applications are invited from registered Dental Surgeons for the appointments of COUNTY DENTAL OFFICERS at Barnstaple, Tavistock, Holsworthy, Exmouth, Sidmouth, Torquay and Kingsbridge. Salary will be £735 rising by annual increments of £25 to £885 per annum (plus a temporary betterment factor of £115 per annum), but previous experience may be taken into consideration when fixing commencing salary. The successful candidate will be required to pass a medical examination and to contribute to the Council's Superannuation Fund Canvassing, either directly or indirectly, will be a disqualification. Forms of application and full particulars of duties can be obtained from the County Medical Officer, 45, St. David's Hill, Exeter, to be returned to him by not later than March 20, 1951. H. A. Davis, Clerk of the Council.

COUNTY Borough of Bournemouth. Applications are invited from registered Dental Surgeons (male or female) for the appointment of an ASSISTANT WHOLE-TIME DENTAL OFFICER at a salary of £735 per annum rising by annual increments of £25 to £835, but previous experience may be taken into account in fixing the commencing salary. The duties will be concerned mainly with the inspection and treatment of school children and mothers and young children. The appointment is subject to the provisions of the National Health Service (Superannuation) Scheme, 1947, and the successful candidate will be required to pass a medical examination. Forms of application may be obtained from the Medical Officer of Health, 17, St. Stephen's Road, Bournemouth, to whom they should be submitted with copies of two recent testimonials, by March 24, 1951. Canvassing, either directly or indirectly, is strictly prohibited and will disqualify. A. Lindsay Clegg, Town Clerk. Town Hall, Bournemouth. February, 1951.

THE University of Manchester. An INSTRUCTOR in DENTAL MECHANICS is required by the Turner Dental School. Salary within the Whitley Council Chief Technicians' Scale, with membership of a Superannuation Scheme and Family Allowances. Duties to commence as soon as possible. Applications should be sent to Professor E. Matthews, The Turner Dental School, Bridge Street, Manchester, 13.

PRACTICES

Available

FOR Sale—Glasgow. Most attractive dental practice near city centre. House is one situated in pleasant professional terrace on private road lying parallel to and separated by lawn from main street. 4 fully equipped modern surgeries with dental units. 3 surgeries overlook pleasant garden. 2 X-ray units, 2 units N_2O and O_2. Model technician's workroom with latest equipment. 2 waiting rooms. 2 rest rooms each with W.C. and H. & C. wash basin. Equipped office. Spare room for 5th surgery if required. Scope unlimited for either single or partnership practice. Sound reason for sale. Although ideal for group practice, it can be sold in parts or as a whole.—Box 1321.

QUALIFIED practice for immediate disposal—West Cornwall. Limited accommodation available, near sea. Owner (Guy's man), will sell at reasonable figure for quick sale or would discuss other suitable arrangements. Full particulars from—Box 1323.

WIMPOLE Street—private practice for disposal for health reasons. Average turnover, £3,500. Vendor making substantial reduction in goodwill premium owing to short lease on present premises. Would sell with or without equipment. Period of introduction, as arranged. Alternatively would consider any reasonable proposal for transfer of patients to established West End practice.—Box 1325.

CENTRAL COUNTIES DENTAL POST-GRADUATE COMMITTEE

Course in Conservative Dentistry

(WOLVERHAMPTON)

The Course is to be held in Wolverhampton at the Wolverhampton Royal Hospital, Cleveland Road, on Wednesday (evenings) between the times 7.30–9.30. The Course will commence on April 4, 1951, and classes will be held as follows :

Wednesday, April 4.
Biological Considerations in Conservative Dentistry. Dr. E. A. Marsland, Ph.D., B.D.S.
Mechanical Considerations in Conservative Dentistry. Mr. R. J. Smith, B.D.S.

Wednesday, April 11.
Amalgam and Silicate Fillings. Mr. R. J. Smith, B.D.S.

Wednesday, April 18.
Root Canal Therapy, Apicectomy and Pulpotomy. Mr. W. Stewart Ross, F.D.S., L.D.S.R.C.S.Eng.

Wednesday, April 25.
Techniques of Gold Inlay Construction. Mr. R. J. Smith, B.D.S.

Wednesday, May 2.
The Uses of Porcelain and Acrylic Resin for Crowns and Inlays. Professor R. W. Lovel, F.D.S., L.D.S.R.C.S.Eng., H.D.D. R.C.S.Ed.

Wednesday, May 9.
Techniques of Caries Prevention and Conservation for Children. Dr. J. L. Hardwick, Ph.D., M.D.S.

Wednesday, May 16.
Aspects of Paradontal Disease and Their Relation to Conservative Procedures. Mr. P. A. Trotter, B.D.S.Birm., H.D.D. R.C.S.Ed., L.D.S. R.C.S.Eng.
Fractures of Children's Teeth. Dr. J. L. Hardwick, Ph.D., M.D.S.

The fee for this Course will be £7 7s., and the applications should be made to the Honorary Secretary, Mr. R. F. Pusey, 51, Calthorpe Road, Edgbaston, Birmingham 15., together with cheque, before March 19, 1951.

FASHIONABLE South Coast Town, established 1919, private and N.H. 11-roomed freehold house. Books audited. £4,500 including equipment and goodwill. Household furniture at valuation if needed. Owner going abroad.—Box 1327.

LONDON 1½ hours. Practice established over 50 years. Pre-N.H.S., £8,781. Succession, definite period. Substantial proportion P.P. Equipment, stock and goodwill at valuation. Part payment from income. Low rental—residential accommodation.—Box 1329.

ACTIVE and established Harley Street practice with best type of goodwill for immediate sale at £2,500. Owner going abroad. Equipment and furnishings included to value of £2,350.—Box 1331.

READING, Berkshire. Old established practice. Elizabethan house, town centre. Ample room for living or extension of surgeries. Safe lease, low rental. Turnover £5,000. Vacant due to death. Quick sale desired.—Box 1333.

EAST Anglia. Dental practice with £10,000 turnover. Good living accommodation in 16th century house within easy reach of London and coast.—Box 1335.

FOR sale. Goodwill and equipment of practice established over 30 years in S.W. London, Middlesex district. Owner retiring owing to age. Would consider partnership with view to early purchase. 11-roomed house can be purchased with immediate possession. Good position, main road close railway station, buses. Excellent opportunity for young L.D.S. wishing to commence on own account.—Box 1337.

BUSY practice established over 30 years in S.W. London, including house, surgical and workroom equipment. Average takings over £4,000 a year. Owner retiring. Accept £2,250 for quick sale. Over £1,000 work on books.—Box 1339.

WIDOW offers dental practice, no premium, generous terms. Mrs. Quantrell, 283, London Road, Southend-on-Sea.

OWNER with two practices wishes to dispose of London, N.W.10 practice, established 1910, worked 3 days only. Last year's takings over £3,000, could be increased. Work in hand about £1,000. Furnished flat, including surgery, £150 p.a. Lease 21 years. Price £1,000, including furniture, fixtures, fittings, etc.—Box 1341.

DENTAL practice for sale in Glasgow, Principal having recently died. Further particulars from Gillespie & Anderson, C.A., 147, Bath Street, Glasgow.

FOR sale, £5,500. Old established practice with house, perfect position in mid-Sussex town. Mechanic on premises—wonderful opportunity for young L.D.S. Reason for selling—ill-health.—Box 1343.

DENTAL practice and house for sale, in medium sized town W.R. Yorkshire. Average takings 1949-50, £3,300 p.a. Price £4,500, includes house, practice, equipment, goodwill. Owner retiring. Living accommodation. Established 38 years.—Box 1345.

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THE

DENTAL NURSES and ASSISTANTS EXAMINATION

Certificate "A"

The next Examination will be held on

SATURDAY, JUNE 30th, 1951

at Leeds and London

Entrance Fee — 2 guineas.

Last day for entry — May 31st, 1951

Syllabus and entry form are to be obtained from the Secretary, Board of Examiners, 4 Hough Lane, Leyland, Lancs. Copies of the Examination Papers, 1944 – 1950, can also be obtained by sending 2/6.

NORTH WALES (lock-up), easy distance from Liverpool. Average turnover, £3,700; Goodwill, £1,000. Semi-detached villa a few miles from practice can be purchased, if desired. Health reason.—Box 1349.

Wanted

CARDIFF. Dental Surgeon wishes to purchase good class practice in Cardiff, preferably with living accommodation.—Box 1351.

HOUSES AND PROFESSIONAL ACCOMMODATION

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CRAIGMORE—Rothesay. Detached house consisting of two self contained flats; ground floor—4 rooms, kitchen, bathroom, etc., upstairs—5 rooms, kitchen, bathroom, etc. Both flats completely separate, but the whole suitable for use as a boarding house. In excellent condition, recently decorated, gas, electricity, water heaters, etc. Good garden with outbuildings. Total assessed rental, £56. Total feuduty £3. Offers for either flat or for the whole subjects should be lodged with Messrs. J. C. Muir & Barr, Writers, 120, St. Vincent Street, Glasgow, from whom further particulars and cards to view may be had.

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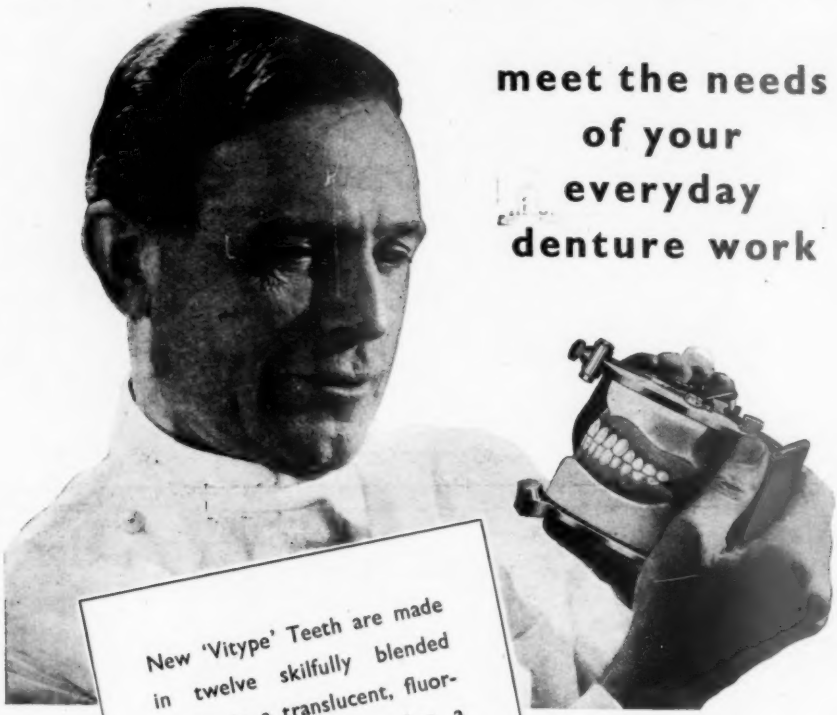

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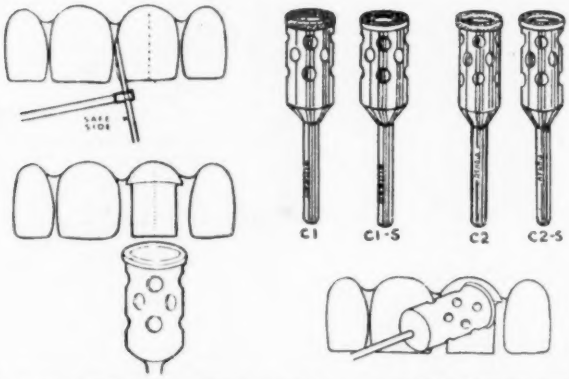

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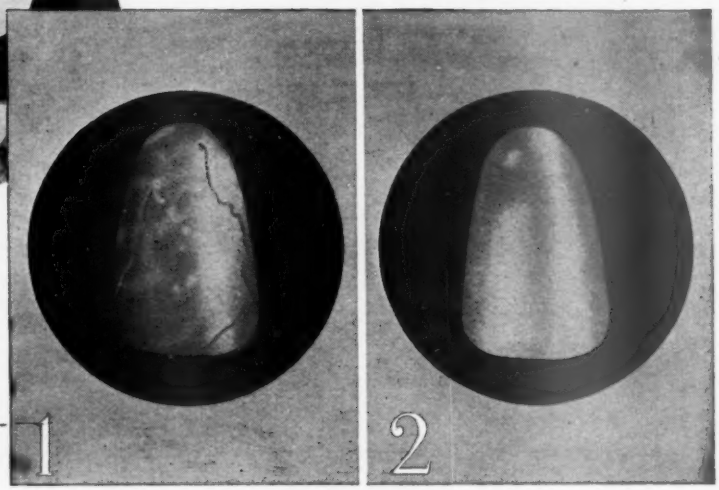

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BRITISH DENTAL JOURNAL

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ORIGINAL COMMUNICATIONS

BUCCAL SULCUS SUPPORTS FOR FACIAL PARALYSIS[1]

BY B. W. FICKLING, F.R.C.S., F.D.S. R.C.S.ENG.

Plastic and Jaw Unit, Hill End Hospital, St. Albans

FACIAL paralysis results in a disability which has both æsthetic and functional components and which tends to have a psychological effect. The importance of early and long-continued electrical stimulation is appreciated and some form of support has usually been advocated. Northfield and Allen (1944) showed how ineffective are many of the forms of support employed, and described a dental appliance based on the teeth and shaped to support the angle of the mouth. Fickling (1944) indicated that by careful moulding in the buccal sulcus an appliance could provide adequate support for all the cheek tissues. It soon became obvious that in most cases the portion passing through the oral fissure was unnecessary. The extra-oral portion breaks whatever lip seal there is, so that smoking becomes impossible, dribbling is increased, and the appliance, being visible, draws attention to the defect.

The buccal sulcus support distends the lateral part of the vestibule of the mouth chiefly in front of the zygomatic process of the maxilla. The point of reflection of the soft tissues away from the bone is not normally the highest point of the sulcus, the tissues run upwards and outwards to a variable extent before turning downwards. A dental impression taken when the cheek tissues are put on the stretch is termed muscle-trimmed. If padding is placed in the sulcus outside the muscle-trimmed contour, the appliance can be dislodged by muscle action, although it may be tolerated in normal use. In facial paralysis there is no muscle action and much greater padding is permissible. It will be displaced only when the tissues are stretched by wide opening of the mouth. It is never possible to apply such padding directly to the bone contour as obtained by a deep impression taken under tension. Ulceration invariably develops at the edge of the dental appliance. It is necessary to follow the anatomical contour of the vestibule, passing upwards, outwards and downwards in a curved manner, and this outward shift naturally causes some prominence on the face. Many persons with long-standing facial paralysis have hollow sunken cheeks and the padding is a distinct advantage. In such cases it is usually advisable to employ similar but less marked padding on the sound side, with very great improvement in the general appearance (figs. 1, 2, 3).

CONSTRUCTION

The buccal sulcus support can be attached to whatever maxillary dental appliance the occlusion indicates. When all the maxillary teeth are present on the affected side a cast silver splint is constructed, to gag the bite as little as possible. Whenever the shape of the teeth allows a tight grip such splints are not cemented. If some teeth are missing from the affected maxillary quadrant a partial denture or a splint can be employed. When the maxillæ are edentulous a full denture is prepared to a *muscle-trimmed contour*. The base appliance must be prosthetically sound and occlusal opponents are necessary if dentures are employed.

Unfortunately the shape of the buccal sulcus support varies in each individual and no preconceived mould can be prepared. The sulcus is being over-emphasised and the degree to which this is permissible can only be determined by trial and error. In a long-standing case, after the tissues have been supported for some time, additional support—with improvement of contour—becomes possible. For these reasons the support is made detachable and is

[1] Paper read at the meeting of the British Association of Plastic Surgeons, June 9, 1950.

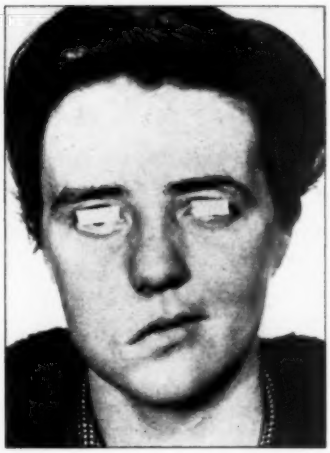

FIG. 1.—Patient, aged 24, with right facial paralysis onset at age 7.

FIG. 2.—Patient (fig. 1) with bilateral support applied to a full upper denture.

held to the base appliance by one or two screws (figs. 3, 4, 5). This allows removal for cleaning, while the support is readily re-processed without subjecting the denture acrylic to repeated processings. In the case of a denture two 6 B.A. stainless steel nuts are incorporated in the premolar region of the buccal flange. After processing and polishing, an acrylic support of minimal size is prepared which fastens to the denture by the screws. After wearing the normal denture to ensure that it is comfortable, the support is applied and modified with dental composition, tracing stick and wax, and is then processed. At subsequent visits the contour is modified, the patient frequently wearing the appliance for a week with composition in situ. When the support is attached to a

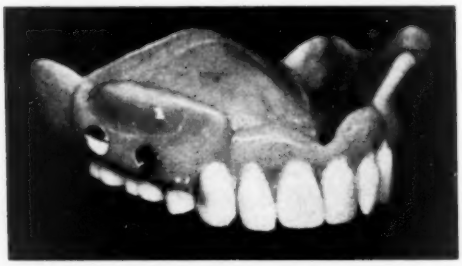

FIG. 3.—Full upper denture with bilateral supports in a unilateral case.

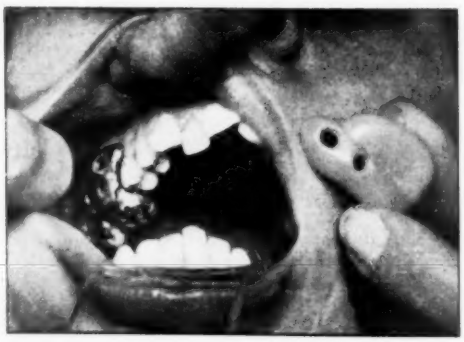

FIG. 4.

FIG. 5.

FIGS. 4 and 5.—Small cast cap splint applied to the molars in a full dentition. The manner of attachment of the acrylic support is shown.

denture the two can be processed together and the screws dispensed with so soon as the optimum contour has been achieved.

Originally conceived as a method of temporary support, these appliances are now employed, n suitable cases, for definitive long-term treatment. Experience over six years now makes it possible to assess the applications and problems of the method.

Temporary Support

It is considered the method of choice in Bell's palsy. One gains the impression that recovery is accelerated, temporarily at least, after insertion of the appliance. The weight being taken off the cheek, the supported muscles are able to show evidence of contraction. This leads to one of the problems, returning tone in the cheek invariably causes ulceration in cases previously comfortable, especially at the anterior margin of the buccinator. Easing is necessary and the support becomes somewhat less effective.

Permanent Support

Severe overaction of the unaffected side militates against this as against many other methods of treatment. It is in these cases that an extra-oral portion may still be required. A brave man may perform Marino's selective neurotomy (1950) on the sound side the better to achieve symmetry. Full fat cheeks give poor results. The sulcus is occupied by the suctorial pad and the additional prominence caused by the appliance is excessive and unsightly.

It is almost better that these patients should be cowed and depressed by their deformity than happy and vivacious in spite of it. Edentulous patients with sunken cheeks and passive countenances give the best results.

The method deals only with the mid-face region. However carefully the padding is placed high in front of the zygomatic process, epiphora is not controlled and other methods must be employed. Unfortunately support in the buccal sulcus does not combine well with fascial support, ulceration tending to occur at the site of the rigid fascial bands. In very severe cases, however, fair results have been obtained.

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THE ROLE OF AMMONIA IN DENTAL CARIES

Part II—Effect of Ammonium Salts and Urea on Salivary Organisms

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Introduction

The work of Kesel *et al.* [1, 2, 3] on the relation of ammonia to dental caries can be considered under two separate headings. Firstly, the production of ammonia by organisms of "caries-free" and "caries-active" saliva; this has been further investigated by the present authors [4 and 5] who were unable to confirm the findings of Kesel *et al.* that saliva from caries-free subjects produced more ammonia than that from subjects who were caries-active, when incubated either alone or with beef broth. The second heading can be described as the effect of ammonium salts and urea on salivary organisms. In this, the American workers stated that the addition of alkaline ammonium salts to a broth culture of a standard organism—the Hadley strain 4646 of *Lactobacillus acidophilus*—inhibited the organism but that acid ammonium salts were inactive. The salts used were ammonium carbonate and ammonium acetate. To determine whether the inhibition was due to ammonia nitrogen or alkalinity, they carried out comparative tests on ammonium acetate and sodium acetate at the same pH—7·2. Under these conditions they found that ammonium acetate only was inhibitory and thus concluded that ammonia or the ammonium ion and not alkalinity was responsible for the inhibition. This experiment—and others—is difficult to interpret because Kesel *et al.* do not state the volume of broth to which the acetate solutions were added thus making it impossible to calculate the final concentration of the salt in the medium. Incidentally, a pure solution of ammonium acetate is slightly acid but is known to be somewhat unstable [6].

These workers give no report of experiments in which the inhibitory action of more alkaline ammonium salts was compared with those of salts of other cations with a similar pH. We think also that the evidence produced by Kesel *et al.* did not satisfactorily eliminate the possibility that alkalinity was the cause of the inhibitory powers of ammonium salts. Since it is known that almost all soluble salts inhibit bacteria, if present in sufficient concentration, [7] it is impossible to decide whether ammonium salts have any specific action unless the inhibitory powers of several ammonium and other salts are compared.

Kesel *et al.* [1] recommended the use of a mouth wash and a tooth powder containing 5 per cent dibasic ammonium phosphate as a caries prophylactic and reported that its use by 55 caries-active subjects for five months resulted in large reductions of their salivary acidophilus counts. A control group used identical material except that the ammonium phosphate was omitted, and in this case no change in acidophilus counts was observed.

In one of their later papers [2] the same workers reported on the effects of 5 per cent dibasic ammonium phosphate on pH changes, titratable acidity, lactic acid production, ammonia nitrogen and acidophilus counts, in saliva (not pure cultures of *Lactobacillus acidophilus*) and 20 per cent glucose incubated for forty-eight hours. They also tried the effects of urea at a concentration of 3 per cent and of 3 per cent urea and 5 per cent ammonium phosphate together. Each experiment was controlled by tubes containing saliva and glucose only, saliva and water only, and saliva and reagent only.

Their results showed that dibasic ammonium phosphate maintained an alkaline pH, had no effect on lactate production at twenty-four or forty-eight hours (but inhibited at four hours) and reduced the acidophilus count to zero by twenty-four hours, but apparently permitted the survival of other acid-producing organisms. The ammonia concentration was found to fall during the experiment but no explanation was offered.

In the experiment with 3 per cent urea, the pH also remained alkaline, and the acidophilus count fell to zero by twenty-four hours but lactate production was increased four times compared with the control tube containing no urea. The ammonia concentration increased by urease action to four times the initial concentration during the forty-eight-hour period. As it was clear from these experiments that neither ammonium phosphate nor urea satisfactorily prevented lactate formation—in spite of reduced acidophilus counts—Kesel *et al.* next tried a mixture of both. This, containing 5 per cent ammonium phosphate in the presence of 3 per cent urea, was found to maintain an alkaline pH, inhibit lactate production completely, and within twenty-four hours the acidophilus count was zero.

The titratable acidities in these experiments will not be quoted or commented on as, in the presence of so powerful a buffer as 5 per cent dibasic ammonium phosphate, they can have little significance.

Although the results quoted do demonstrate the efficacy of mixtures of dibasic ammonium phosphate and urea in inhibiting acidophilus and maintaining alkalinity, several points in these experiments call for comment.

First it is important to emphasise the lack of correlation between lactate production, acidophilus counts and pH. Although the pH remained alkaline and the acidophilus counts fell with all three reagents, large quantities of lactate were produced in the presence of urea alone, and with ammonium phosphate as much was produced as in the control. It is clear, therefore, that acidophilus counts and pH changes are not a reliable guide to lactate production in test-tube experiments. It must be assumed that acid-producing organisms other than acidophilus were active since in certain stages of the experiments lactate was produced—e.g. between twenty-four and forty-eight hours after the addition of ammonium phosphate—during the whole of which time the acidophilus count was stated to be zero.

The fall in ammonia concentration which occurred in the presence of ammonium phosphate and glucose may be related to a phenomenon we have observed in unpublished experiments, namely that the ammonia of saliva and glucose mixtures incubated for several days usually falls to zero. Since the pH of our mixtures was about 4·00, no ammonia would be lost by volatilisation and we think it likely that this ammonia is used as a source of nitrogen for synthesising protein in the course of bacterial growth.

We cannot understand figures quoted by Kesel *et al.* [2] (their Table VI) in which the ammonia in a control mixture of saliva and glucose (Tube B) falls *within four hours* from 0·081 to zero. It has been our invariable experience that in saliva-glucose mixtures the ammonia concentration rises for about forty-eight hours, then slowly falls to zero. In the absence of glucose we have found it to rise steadily for days, yet the figures in Table VI (Tube A) of Kesel *et al.* show a fall of ammonia content from 0·081 to "a trace" within four hours.

We are also unable to understand why Kesel *et al.* found in the presence of 3 per cent urea alone, the ammonia concentration of the saliva mixture rose only from 0·081 to 0·31 mg. per ml. tube contents in forty-eight hours. In our experience salivary ureases cause a net increase to at least ten times the original ammonia under these conditions. Figures relating to this point will be given later.

The experiments of Kesel *et al.* on human subjects were virtually confined to acidophilus counts as, although clinical examinations of the

teeth of the users of the mouth wash were made and the results suggested some reduction in caries activity, it was admitted that the observations were inadequately controlled.

A more satisfactory clinical experiment is reported by Henschel and Lieber [8] who compared the average DMF per year in 100 private patients during the use of a cosmetic dentifrice for an average of 93·8 months, with the DMF per year in the same patients for a further period averaging 34·3 months during which an ammoniated dentifrice was used. The average DMF per year during the experimental period fell by 35·2 per cent whereas in a second group of 50 patients, who used a cosmetic dentifrice during both periods, it rose by 7·3 per cent. Here again, however, these authors are not convinced that the effect was produced entirely by the ammoniated dentifrice.

Cobe [9] in a preliminary report states that the use of dentifrices containing urea by 300 children for eighteen months lowered acidophilus counts by an average of 46 per cent. It was not made clear whether a reduction occurred in all cases, and the effect on clinical caries was not recorded.

It can be said, therefore, that it is not yet known whether the ammoniated dentifrices of the type so far suggested do have any influence on dental caries. It seems unlikely, however, that they can have any dramatic anticaries action or this would have been detected by Henschel and Lieber. It is of interest to note that these workers used 22·5 per cent urea and 5 per cent dibasic ammonium phosphate "as having the highest content of active ingredients which under average home use caused no irritation." They considered that high concentrations of urea were necessary for greatest effectiveness and mention that urea acts as a protein denaturing agent and along with ammonium phosphate has a high buffer action.

As no explanation was offered by Kesel *et al.* for their important findings on the influence of urea and ammonium phosphate on salivary organisms, it was decided to repeat and extend their experiments in an attempt to elucidate the effects of these two substances on salivary acid production.

Experimental

(A) The nature of the inhibition of acid production by alkaline ammonium salts.

Preliminary experiments confirmed the observation of Kesel *et al.* that the addition of high concentrations of alkaline ammonium salts to saliva and glucose inhibited lactate production and prevented growth of *Lactobacillus acidophilus*. As already mentioned, the effect of alkaline ammonium salts had not been satisfactorily differentiated by Kesel *et al.* either from the effect of alkalinity or from non-specific salt action.

A series of tests were carried out on the pH changes and lactate production during the incubation of saliva and glucose with a range of concentrations of sodium bicarbonate and ammonium bicarbonate. Throughout this research, samples were incubated at 37° C., pH changes were measured by a Cambridge pH meter and lactate estimated by the method of Friedemann and Graeser [10]. The results of a typical experiment are given in Table I and show that high concentrations (e.g. above 2·5 per cent) of either sodium or ammonium bicarbonate strongly inhibit lactate production and completely prevent the fall in pH observed in the water control. Lower concentrations of both salts, however, permitted a fall of pH and caused a greatly *increased* production of lactic acid, e.g. in the presence of 1·25 per cent of both salts, more than three times as much lactic acid was produced as compared with the water control.

TABLE I

Effect of ammonium bicarbonate and sodium bicarbonate on pH and lactate production by saliva

Incubation mixture { 2 ml. saliva. 2 ml. bicarbonate solution or water. 1 ml. 20 per cent glucose.

Salt added	*Conc. in final mixture (per cent)*	*pH* 0 *hours*	4 *hours*	24 *hours*	*Lactate expressed as per cent of control, 24 hours*
$(NH_4)HCO_3$	5·0	7·93	8·26	8·58	trace
,,	2·5	8·01	8·29	8·61	50
,,	1·25	8·08	7·93	5·43	372
,,	0·62	8·09	6·93	4·50	246
$NaHCO_3$	5·0	8·09	8·58	9·05	trace
,,	2·5	8·11	8·66	9·16	59
,,	1·25	8·20	7·72	5·42	364
,,	0·62	8·17	7·02	4·51	225
Water control	—	7·67	4·35	3·90	100

(Owing to the high blank reading obtained in the method of lactate determination, very small quantities of lactic acid are difficult to estimate with confidence. Rather than give an impression of spurious accuracy, we prefer to use the term "trace" in these cases.)

In about half of 13 experiments of this type we have found that the inhibitory power of ammonium bicarbonate is somewhat greater than that of sodium bicarbonate, i.e. inhibition occurs at a slightly lower concentration.

It is clear from these experiments that, although ammonium bicarbonate is a slightly more powerful inhibitor than sodium bicarbonate, either alkalinity, or the presence of a salt, or the bicarbonate ion or buffering action might be responsible for the observed inhibition. To

distinguish between bicarbonate ion and the other possibilities the effect of dibasic ammonium phosphate (pH 7·8) was compared with that of sodium phosphate buffer at a similar pH. As Table II shows, high equimolecular concentrations of both salts greatly inhibited lactate production, and the ammonium salt was again slightly more active than the sodium phosphate. As with the bicarbonates, lower concentrations of both salts caused an increased lactic acid production. The concentration of salts required for inhibition varied from saliva to saliva.

TABLE II

Comparison of inhibitory effect of sodium and ammonium phosphates on pH and lactate production by saliva

Incubation mixture { 2 ml. saliva. 2 ml. phosphate solution or water. 1 ml. 20 per cent glucose.

Salt added	*Conc. in final mixture (per cent)*	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate (Control = 100)*
$(NH_4)_2HPO_4$ ...	3·8	7·82	7·63	12·5
,, ...	0·9	7·82	7·24	25
,, ...	0·45	7·80	5·97	143
Na_2HPO_4 plus NaH_2PO_4 at pH 7·9 ...	4·0	7·92	7·64	30
...	2·0	7·94	7·16	28
...	0·5	7·94	4·89	310
Water control	—	7·38	4·04	100

Similar results were obtained in the experiments on saliva with sodium and ammonium acetates ; high concentrations inhibited, lower concentrations enhanced, lactate production, and the ammonium was slightly more active than the sodium salt.

The inhibitory powers of these three pairs of salts were also compared on pure cultures of *Lactobacillus acidophilus*. A range of concentrations of Seitz-filtered solutions of ammonium bicarbonate and sodium bicarbonate, ammonium phosphate and sodium phosphate, and ammonium acetate and sodium acetate added to sterile beef broth containing glucose were set up, the pHs of the broths containing the sodium salts being adjusted—where necessary—to those of the ammonium salts. The tubes, which were set up in quadruplicate, were inoculated with a loopful of a suspension of a strain of *Lactobacillus acidophilus* (three strains were used altogether) and after two days' incubation the pHs, turbidities and, in some cases, lactate concentrations were determined. The results agreed with the previous results obtained on saliva.

The results of all these experiments indicate that high concentrations of all six salts inhibit lactate production, and since ammonium acetate is slightly acid neither the ammonium ion nor alkalinity can account for all their inhibitory powers.

Next, the possibility was considered that the inhibition was caused simply by the presence of the salt and was independent of pH. Tests were therefore made of the effect of sodium chloride over a range of concentrations and Table III represents the results of a typical experiment which shows that this salt does inhibit at high concentrations.

TABLE III

Effect of a range of concentrations of sodium chloride on lactate production by saliva and glucose

Incubation mixture { 2 ml. saliva. 2 ml. NaCl solution (or water). 1 ml. 20 per cent glucose.

Conc. of NaCl in final mixture (per cent)	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate formed in 24 hours (Control = 100)*
0 (water control) ...	7·12	4·04	100
1	7·04	3·95	80
2	6·94	4·07	69
4	6·90	4·80	77
8	6·74	7·11	39

Other experiments have, however, provided evidence that alkalinity favours the inhibitory action of salts and may account for the observation of Kesel *et al.* that alkaline ammonium salts inhibit while acid salts do not. Although we have not studied acid ammonium salts as thoroughly as the alkaline ones, we have observed that a final concentration of 5 per cent ammonium succinate, tartrate, citrate and sulphate showed no consistent inhibition.

It can easily be shown that alkalinity itself plays no part in the inhibition by the following experiments. Firstly, two tubes of saliva and glucose were set up and one is adjusted to a pH of 9·0—or even 9·5—by the addition of 0·1 N NaOH, and both were incubated. The pH of the alkaline saliva reached a final value of about 4·0 only slightly less rapidly than the control, and the amount of lactate formed was similar. Secondly, two similar tubes were again set up and one was adjusted to pH 9·0 by addition of 0·1 N NaOH, but in this experiment the pH was determined at hourly intervals during the incubation and 0·1 N NaOH was added to this tube after each pH determination to restore the initial pH of 9·0. *At no time during the experiment was the pH in this tube allowed to fall below* 8·0. The volumes of the two tubes were maintained equal by the addition of water to the control. Thus in this control the pH fell continually to about 4·0 while in the other it was alternating between pH 8·0 and 9·0 throughout the experiment. Examination of the lactate concentrations in the two tubes showed them

to be similar in both. It is clear, therefore, that alkalinity itself has no inhibitory action on salivary acid production—a fact which was observed by Miller [11] in 1904.

If a solution is made alkaline in the presence of a concentration of salt which at neutral or acid pHs is not inhibitory, then inhibition is found to occur. This observation is illustrated by the experiment recorded in Table IV in which the effect of 2 per cent potassium chloride and that of 2 per cent sodium chloride on salivary acid production are compared with and without the hourly additions of alkali to a pH of 9·20. The salts alone, it will be observed, actually stimulate lactate production—a well-known property of salts in low concentration [7]—but at an alkaline pH both salts were markedly inhibitory. It will be noted that the lactate formed in the second control tube—to which alkali had been added—was greater than in the first. The reason for this will be dealt with later in this paper.

TABLE IV

Typical experiment showing the effect of a final concentration of 2 per cent sodium chloride or potassium chloride at different pHs on salivary acid production

Incubation mixture { 2 ml. saliva. 2 ml. salt solution (or H_2O in controls). 1 ml. 20 per cent glucose.

Salt added	*pH* *Initial*	*pH* *Final*	*Lactate* (*Control* = 100)	*Total amount of 0·1 N alkali used to maintain alkalinity*
2 per cent KCl ...	6·98	4·60	115	None
2 per cent NaCl ...	6·88	4·36	130	None
Water control ...	7·15	4·42	100	None
2 per cent KCl ...	9·20	9·10	trace	0·22 ml.
2 per cent NaCl ...	9·20	8·97	58	0·24 ml.
Water control ...	9·20	7·66	230	0·61 ml.

Further evidence of the greater sensitivity of salivary acid-producing bacteria to salts at an alkaline pH is provided by comparing the effects of disodium hydrogen phosphate (pH about 8·0) and sodium dihydrogen phosphate (pH about 5·0). The alkaline salt inhibits while the acid salt increases lactate production—as will be seen from the experiment quoted in Table V.

TABLE V

Comparison of effect of a final concentration of 4 per cent acid and basic sodium phosphates on salivary acid production

Incubation mixture { 2 ml. saliva. 2 ml. salt (10 per cent NaH_2PO_4 or Na_2HPO_4). 1 ml. 20 per cent glucose.

Salt added	*pH* *0 hours*	*pH* *24 hours*	*Lactate* (*Control* = 100)
NaH_2PO_4	4·91	4·63	125
Na_2HPO_4	8·24	8·33	38
Water control ...	7·33	4·06	100

A full discussion of these results is presented later in this paper.

(B) The cause of the enhanced acid production observed with the lower concentrations of ammonium bicarbonate and sodium bicarbonate.

It was observed that if enhancement of lactate production occurred following the addition of a salt, it was always accompanied by a fall in pH. This means that the buffering power of the added salt was too weak to prevent a fall of pH although we found that it did slow it up, compared with the water control which had no buffering substances other than those present in the saliva. It seemed possible that as the pH fell more slowly, it would be near the optimum pH for acid production—which we have found is between 6·0 and 7·0 (unpublished results)—for a longer time than in the case of a water control and more lactic acid would be produced. To test this hypothesis, two tubes of saliva and glucose were set up, and their pHs determined at intervals during the incubation. To one was added 0·1 N NaOH, and to the other equivalent amounts of water, in the same way as described above, except that in this experiment the pH was *allowed to fluctuate* during the additions between *the initial pH and approximately pH* 5·0. Estimations invariably showed that about one and a half times as much lactate produced in the tube was as frequently neutralised as in the water control. This is shown by a typical experiment quoted in Table VI.

TABLE VI

Effect of frequently neutralising the lactic acid formed during the course of the incubation of saliva-glucose mixtures

Incubation for 3 hours

	Initial pH	*pH*	*Vol. of addition*	*pH after addition*
Water control ...	6·77	6·04	0·15 ml. H_2O	6·00
Tube to which NaOH was added ...	6·79	6·00	0·15 ml. 0·1 N NaOH	7·00

Incubation for 5 hours

	pH	*Vol. of addition*	*pH after addition*
Water control ...	4·44	0·41 ml. H_2O	4·44
Tube to which NaOH was added	4·95	0·41 ml. 0·1 N NaOH	7·02

Incubation for 7 hours

	pH	*Vol. of addition*	*pH after addition*
Water control ...	4·62	0·55 ml. H_2O	4·62
Tube to which NaOH was added	4·70	0·55 ml. 0·1 N NaOH	6·90

Incubation for 24 hours

	pH	*Lactate* (*Control* = 100)
Water control	4·01	100
Tube to which NaOH was added	4·16	167

The results of these experiments are therefore consistent with our hypothesis that the observed enhancement of lactate formation by the more dilute alkaline buffers is due to a slowing up of the fall of pH, thus prolonging the time during which the pH of the mixture is near the optimum for acid production. In addition to this buffering action it is possible that the salts themselves exerted a stimulating action in the same way as that we have sometimes observed with sodium chloride.

(C) The effect of urea with and without phosphate.

Since Kesel *et al.* had shown that urea at a final concentration of 1·5 per cent was not inhibitory but greatly stimulated lactate production in saliva-glucose mixtures, it was decided to reinvestigate, and if possible explain, this observation, in the light of our previous findings. Fig. 1 represents the results of an experiment in which the pH, ammonia and lactate production of saliva and glucose were compared in the presence or absence of a final concentration of 1·2 per cent urea, with frequent estimations during the early part of the experiment. The microdiffusion method of Conway and O'Malley [12] was used to estimate the ammonia concentrations.

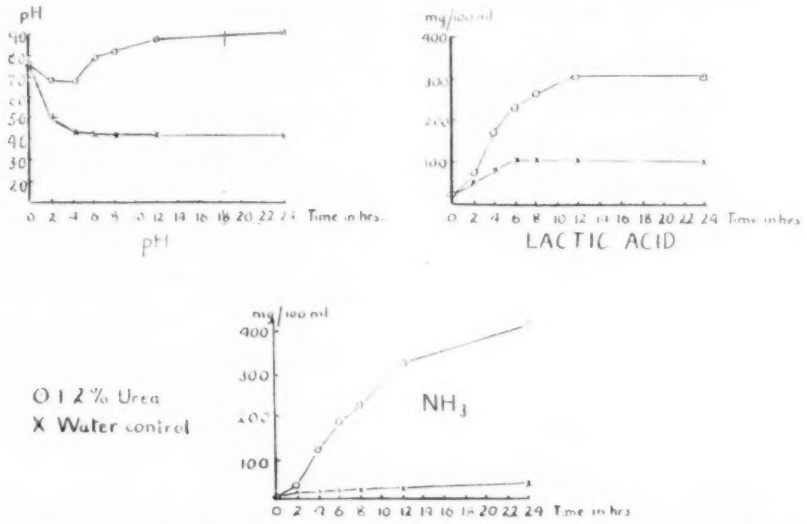

FIG. 1.—pH, lactic acid and ammonia production by saliva-glucose mixtures with and without urea.

It is clear from this experiment, which is typical of many, that concentrations of urea of this order do greatly increase lactate production. Investigations of this type suggested that the course of events was as follows: Urea breakdown, by action of bacterial ureases present in saliva, and lactate production occur simultaneously during the first few hours of the experiment, the net result being a slight fall in pH to about the optimum for acid production. As more ammonia is produced, the buffering power rises sufficiently to prevent the lactic acid from lowering the pH any further. Later, ammonia production increases and more than neutralises the lactic acid so that the pH begins to rise, reaching, between eight and twelve hours, a value at which the ammonium carbonate formed by urease action is inhibitory to acid production. At this stage lactate formation ceases while urease activity continues, as shown by the rise in ammonia concentration throughout the twenty-four hours.

The cessation of lactate production at six hours in the water control is usual, and is probably caused by the low pH being unfavourable to bacterial acid production.

It is therefore concluded that the cause of the increased lactate production occurring during incubation with urea is in principle identical with the explanation suggested above for the similar increase with the more dilute buffer solutions, that is, the maintenance of the pH near the optimum for several hours.

These experiments also clearly show the ineffectiveness of the ammonium ion as an

inhibitor of lactate production. Acid production continues unabated between the fourth and the eighth hour—a phase of the experiment during which the ammonia concentration is between two and three times greater than the level which Kesel *et al.* state is inhibitory. It will be noted from fig. 1 that the ammonia concentration in the presence of urea increases to a level approximately twenty times that of the control. This contrasts sharply with the results of Kesel *et al.* [2] who, as has been mentioned previously, found under similar conditions only a three-fold rise in twenty-four hours.

The effect of final concentrations of 1·2 per cent urea and 2·0 per cent ammonium phosphate was next tested, since this mixture was comparable with the most inhibitory of the reagents used in the experiments of Kesel *et al.* Table VII shows an experiment demonstrating the effects of the mixture compared with that of each constituent singly, and it is clear that the conclusion of Kesel *et al.* is confirmed.

TABLE VII

Effect of final concentration of 1·2 per cent urea, 2 per cent dibasic ammonium phosphate and a mixture of both on lactate production

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

Reagent	*pH*			*Lactate* (*Control* = 100)	
	0 hours	*4 hours*	*24 hours*	*4 hours*	*24 hours*
1·2 per cent urea	7·14	6·41	8·76	79	270
2 per cent $(NH_4)_2HPO_4$	7·86	7·80	7·68	15	33
1·2 per cent urea plus 2 per cent $(NH_4)_2HPO_4$	7·90	7·84	7·68	6	6
Water control	7·25	5·18	4·32	38	100

In seeking an explanation of the efficacy of this mixture we studied the ammonia production (that is, the rate of breakdown of the added urea) in the presence of ammonium phosphate. Since Howell and Summer [13] have shown that various buffers exert a great influence on the rate of urease action, it seemed possible that the presence of ammonium phosphate might modify urease action and that any such change might be correlated with the inhibition of acid production. This experiment is somewhat difficult technically because it is necessary, in some of the tubes, to measure the production of relatively small quantities of ammonia in the presence, throughout the experiment, of a high ammonia concentration from the ammonium phosphate. The experiments showed that in the presence of dibasic ammonium phosphate the breakdown of urea is almost completely suppressed. (This point is illustrated in Table VIII, right-hand column.)

Experiments were then carried out to decide whether it was the ammonium ion, the phosphate ion or the pH which was responsible for this inhibition of urease. Although Howell and Sumner had studied the effects of a variety of buffers on crystalline urease from jack bean meal it was clearly desirable to reinvestigate the matter with saliva. For this experiment, saliva and glucose were added to tubes containing duplicate sets of sodium phosphate buffers covering the range of pHs possible with phosphate buffers. The first set of tubes contained urea (final conc. 1·2 per cent). The second set contained no added urea. By estimating ammonia production in both sets it was possible, by subtraction of the ammonia formed from normal constituents of saliva in the control set, to determine the rate of release of ammonia from the added urea. Similar sets of ammonium phosphate buffers with and without urea at the same pHs as the sodium phosphate buffers, were treated in the same way. The ammonia produced from the added urea was again determined by subtracting the ammonia concentration figure in the "no urea" tubes (not recorded in Table VIII) from that of the "added urea" set, at the corresponding pH. A control tube with saliva, glucose and urea, but no buffer, was also set up.

The figures for ammonia production from urea, expressed as a percentage of ammonia production in the control tube without buffer, are given in Table VIII and from this typical experiment it is clear that sodium phosphate inhibits urease activity most powerfully at the alkaline pHs, but ammonium phosphate almost completely inhibits over the whole range, probably because the ammonium ion also suppresses urease according to the Law of Mass Action.

TABLE VIII

Comparison of the effects of ammonium and sodium phosphate on salivary urease over a range of pH

Incubation mixture { 2 ml. saliva. 2 ml. 10 per cent buffer with or without urea. 1 ml. 20 per cent glucose.

Buffer	*pH*		*Ammonia produced* (*per cent of that in tube with no buffer*)
	0 hours	*24 hours*	
Sodium phosphate (with urea)	8·40	7·81	8
	6·76	6·40	12
	5·56	6·33	72
Ammonium phosphate (with urea)	7·84	7·39	trace
	6·67	6·21	trace
	5·54	5·40	12
Urea only (no buffer)	7·24	8·49	100

Further evidence for our theory of the mode of action of urea and ammonium phosphate mixtures is provided by our finding that a mixture giving final concentrations of 2·0 per cent

alkaline *sodium* phosphate and 1·2 per cent urea was as powerful an inhibitor of lactate production as 2·0 per cent ammonium phosphate and 1·2 per cent urea. The results of a typical experiment of this kind are given in Table IX.

TABLE IX

Comparison of 2 per cent sodium phosphate and 2 per cent ammonium phosphate with and without 1·2 per cent urea on lactate production

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

Reagent	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate* (*Water control* = 100)
Water control	7·5	4·0	100
1·2 per cent urea ...	7·5	8·6	470
2 per cent Na_2HPO_4 ...	8·4	7·0	92
1·2 per cent urea plus 2 per cent Na_2HPO_4	8·4	8·4	28
2 per cent $(NH_4)_2HPO_4$	7·8	7·2	108
1·2 per cent urea plus 2 per cent $(NH_4)_2HPO_4$	7·8	7·9	24

This table when compared with Table VII also illustrates the range of variation in the effects of the reagents used, particularly ammonium and sodium phosphate. In the results shown in Table VII 2 per cent ammonium phosphate inhibits while in Table IX a slight increase is observed in lactate production under the same conditions. These variations, which have been mentioned above, are presumably due to the qualitative and quantitative differences in the organisms which must be expected between samples of saliva.

(D) The cause of the inhibitory action of urea and ammonium phosphate mixtures.

The fact that urea is not degraded by salivary urease in the presence of ammonium phosphate suggested that urea itself above a certain concentration might be responsible for the inhibition of acid production shown by the mixture. Since, in the absence of ammonium phosphate, a concentration of 1·2 per cent urea falls as a result of urease action, it could be presumed that it would soon fall below the concentration necessary for inhibition. This possibility that urea interferes with the acid production mechanism had already been suggested by Stephan in 1943 [14]. If the hypothesis that urea is an inhibitor were correct, then two predictions should be fulfilled. First, high concentrations of urea—say 10 per cent—should be inhibitory even without ammonium phosphate, since ureases, if active at all, would only succeed in lowering the urea concentration, during the incubation period, by a small proportion, perhaps from 10 per cent to 8 per cent. A concentration exceeding the inhibitory level should therefore be present throughout. Kato [15] and Howell and Sumner [13] have shown that high concentrations of urea actually inhibit urease at pHs higher than 6·0, and it seemed possible that in the presence of 10 per cent urea almost no urease activity would occur.

Kesel *et al.* also hint that high concentrations inhibit urease, but since such an inhibition would prevent the ammonia which their theory suggests is necessary to stop acid production, they state that they deliberately refrained from using high concentrations of urea.

The second prediction is that quite low concentrations of urea might be inhibitory to *Lactobacillus acidophilus* in pure culture, since most strains of these organisms contain no urease. In this case all the urea added would be available throughout the experiment to inhibit acid production.

The experiments we conducted showed that both these predictions were fulfilled. Tables X and XI show the effect of high urea concentrations on pH changes, lactate and ammonia production. It is clear that lactate production and urease action are greatly reduced, though not completely inhibited, if the urea concentration exceeds 9·6 per cent.

TABLE X

Effect of high urea concentrations on saliva-glucose mixtures

Incubation mixture { 2 ml. saliva. 2 ml. H_2O or urea solution. 1 ml. 20 per cent glucose.

Final concentration of urea	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate* (*Control* = 100)
0	7·50	4·07	100
1·2	7·50	8·56	580
4·8	7·50	6·42	290
9·6	7·50	8·78	23
12·0	7·50	8·80	15

TABLE XI

Effect of high urea concentrations on salivary ureases

Incubation mixture { 2 ml. saliva. 2 ml. urea solution. 1 ml. 20 per cent glucose.

Final concentration of urea per cent	*Ammonia produced in each tube* (*mg.*)	*Urea broken down in each tube* (*mg.*)
1·6	10·5	17·5
3·2	7·0	11·6
6·4	3·0	5·0
9·6	1·5	2·5
16·0	0·5	0·8

Table XII represents a typical experiment and shows that the strains of *Lactobacillus acidophilus* used contained no urease (since the ammonia concentration did not rise during the experiment) and that concentrations of urea greater than 2·7 per cent for one strain, and 1·35 per cent for another, did under these circumstances inhibit growth and lactate production.

TABLE XII

Effect of urea on pure cultures of *Lactobacillus acidophilus* (incubated 72 hours)

	Final concentration of urea per cent	0	10·8	5·4	2·7	1·35	0·675	0·225
1st strain	Growth	+ + +	0	0	±	++	++	++
	Lactate produced (Control = 100)	100	0	25	75	—	—	—
	pH	4·66	7·51	7·33	6·51	4·78	4·50	4·63
	Ammonia mg./ml.	0·6	0·6	0·6	0·6	0·6	0·6	0·6
2nd strain	Growth	+ + +	0	0	0	+	++	++
	Lactate produced (Control = 100)	100	—	—	0	60	—	60
	pH	5·10	7·54	7·46	7·26	5·58	7·06	4·78
	Ammonia mg./ml.	0·6	0·6	0·6	0·6	0·6	0·6	0·6

Another interesting point emerges from this experiment on pure cultures of *Lactobacillus acidophilus*, namely that there is no sign of any increase in lactate with low concentrations of urea. This fits in well with our theory since increased lactic acid production would only be expected if urea is broken down and the pH is thereby maintained nearly neutral.

Since a high concentration of urea is so effective an inhibitor of lactate production by saliva, the question arises whether dibasic ammonium phosphate is a necessary constituent of a mixture containing 22·5 per cent urea, which is the percentage in certain commercial tooth powders and in the material used by Henschel and Lieber. Comparisons were therefore made of the effect on salivary lactate production of a final concentration of 8 per cent and 16 per cent urea with and without 2 per cent ammonium phosphate. The results of a typical experiment are given in Table XIII. This table shows that the mixture of 8 per cent urea and ammonium phosphate (final concentration 2 per cent) is more inhibitory to lactate production than is 8 per cent urea alone. Table XIII also shows that again the ammonium ion is not exerting any specific action, since 8 per cent urea and 2 per cent sodium phosphate buffer (at the same pH as the ammonium phosphate) is as powerful an inhibitor as 8 per cent urea and 2 per cent ammonium phosphate.

With final concentrations of 16 per cent urea we found that the inhibition of lactate production in most samples of saliva was virtually complete and at this concentration, therefore, the addition of ammonium phosphate had no significant effect. This is illustrated by the experiment quoted in Table XIV.

If 8 per cent urea does not completely inhibit lactate production by saliva (as opposed to pure cultures of *Lactobacillus acidophilus*) it is most unlikely that 1·2 per cent would be completely inhibitory. Since final concentrations of 1·2 per cent urea and 2 per cent ammonium phosphate are, however, completely inhibitory, the presence of ammonium or sodium phosphate must exert some effect on the inhibition by low urea mixtures in addition to its effect in preventing urea breakdown.

Among several explanations of the additional

TABLE XIII

Comparison of the effect on salivary lactate production of a final concentration of 8 per cent urea with and without 2 per cent ammonium or 2 per cent sodium phosphate

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

	Reagent	pH 0 hours	pH 24 hours	Lactate (Control = 100)
Saliva specimen No. 1	Water control	6·73	3·68	100
	8 per cent urea	7·21	9·00	36
	8 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·86	8·03	trace
	8 per cent urea plus 2 per cent Na_2HPO_4 ...	7·80	8·32	trace
Saliva specimen No. 2	Water control	6·96	3·92	100
	8 per cent urea	7·14	8·61	51
	8 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·88	7·77	trace
	8 per cent urea plus 2 per cent Na_2HPO_4 ...	7·80	7·96	trace
Saliva specimen No. 3	Water control	7·60	3·87	100
	8 per cent urea	7·71	9·02	43
	8 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·78	8·30	trace
	8 per cent urea plus 2 per cent Na_2HPO_4 ...	7·80	8·82	trace

TABLE XIV

Comparison of the effect on salivary lactate production of a final concentration of 16 per cent urea with and without 2 per cent ammonium phosphate

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

	Reagent	pH 0 hours	pH 24 hours	Lactate (Control = 100)
Saliva specimen No. 1	Water control	6·59	4·25	100
	16 per cent urea	7·10	8·86	13
	16 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·80	7·84	13
Saliva specimen No. 2	Water control	7·06	3·80	100
	16 per cent urea	7·67	5·12	16
	16 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·88	8·40	trace
Saliva specimen No. 3	Water control	7·33	3·74	100
	16 per cent urea	7·58	9·03	trace
	16 per cent urea plus 2 per cent $(NH_4)_2HPO_4$ ...	7·88	7·84	trace

effectiveness of phosphates with low concentrations of urea was the possibility that the inhibitory effect of urea, and that of salts at an alkaline pH, were additive under the conditions of these experiments. If this explanation were correct, then salts other than phosphates should be effective in reinforcing the inhibitory powers of urea. Tests comparing lactate production in the presence of 1 per cent urea with and without 2 per cent sodium chloride showed, however, that the already increased lactate production caused by 1 per cent urea alone was further enhanced by the presence of 2 per cent NaCl. Clearly, therefore, the effect of ammonium phosphate in the presence of 1 per cent urea is not due to the additive action of urea and ammonium phosphate, and remains unexplained. Curiously enough, in the presence of 8 per cent urea, 2 per cent sodium chloride was found to increase the inhibitory action of high concentrations of urea. The results of an experiment of this kind are shown in Table XV.

TABLE XV

Effect of a final concentration of 8 per cent urea with and without 2 per cent sodium chloride on lactate production by saliva

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

Reagent	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate* (*Control* = 100)
8 per cent urea	7·36	8·29	16
8 per cent urea plus 2 per cent NaCl...	7·08	7·12	trace
0·8 per cent urea	7·36	8·58	180
0·8 per cent urea plus 2 per cent NaCl...	7·02	7·60	215
2 per cent NaCl	6·94	4·07	69
H_2O control	7·12	4·04	100

(E) The effect of dilute mixtures of ammonium phosphate and urea.

The experiments quoted in this paper support the belief that a high concentration of urea and ammonium phosphate would effectively reduce acid production in the mouth, and maintain the pH above 7·0. Experiments have also been quoted to show that a final concentration of 1 per cent urea added to saliva alone greatly increases the acid production, and the question arises : what is the effect of a dilute solution of the urea-ammonium phosphate mixture ? If dilute solutions of ammonium phosphate failed to inhibit urease, then the urea concentration would probably also be too low to inhibit urease or acid production. Urea would be broken down and, as has been shown earlier in this paper, the result might be an increased lactate production. Immediately after using a mixture of urea and ammonium phosphate as a dentifrice it is likely that the inhibitory concentrations are present, but by virtue of dilution with saliva it is obvious that they could not be maintained.

It seemed therefore important to study the effects of dilute mixtures as a guide to the possible practical value of urea-ammonium phosphate mixtures in the mouth.

The effect was studied of a range of concentrations of urea-ammonium phosphate mixtures on the pH developed and lactate produced by saliva and glucose. Table XVI shows that low concentrations, although maintaining the pH above 7·0, did promote high lactate production. Clearly, these lower concentrations of both ammonium phosphate and urea were too low to inhibit urease or acid-producing mechanisms.

TABLE XVI

Experiment illustrating the effect of ranges of concentrations of urea and ammonium phosphate mixtures on lactate production by saliva

Incubation mixture { 2 ml. saliva. 2 ml. reagent. 1 ml. 20 per cent glucose.

Reagent	*pH* 0 *hours*	*pH* 24 *hours*	*Lactate* (*Control* = 100)
8 per cent urea plus 2 per cent $(NH_4)_2HPO_4$	7·80	7·69	trace
4 per cent urea plus 1 per cent $(NH_4)_2HPO_4$	7·61	8·14	46
1·3 per cent urea plus 0·3 per cent $(NH_4)_2HPO_4$	7·34	8·74	380
Water control	6·56	4·21	100

(F) Effect of urea-ammonium phosphate mixtures on general bacterial growth in saliva.

While we prefer to reserve judgment, the work of Kesel *et al.* and other workers cited presupposes an acceptance of the acid-decalcification theory of caries. If, however, the proteolytic theory be correct, it is difficult to investigate the possible value of any prophylactic measures because the organisms capable of digesting enamel protein have not yet been identified or even detected with certainty. Nevertheless it was of interest to find out whether urea-ammonium phosphate mixtures were inhibitory to salivary organisms in general or whether the effects already described were specific for acid-producing organisms. The effect of a solution of 20 per cent urea and 5 per cent ammonium phosphate was investigated on saliva incubated alone (in which proteolytic organisms would be predominant) and on saliva incubated with glucose (which favours acid producers).

The tubes were set up as follows :

	A	B	C	D
Saliva	2 mls.	2 mls.	2 mls.	2 mls.
Urea and ammonium phosphate mixture	2 mls.	2 mls.	—	—
Water	1 ml.	—	3 mls.	2 mls.
20 per cent glucose	—	1 ml.	—	1 ml.

Nutrient agar plates were spread with 0·1 ml. of the above mixtures (*a*) immediately on mixing, and (*b*) after twenty-four hours' incubation of the tubes at 37° C. Both sets of plates were examined after a further twenty-four hours' incubation. Colony counts in the twenty-four-hour samples showed a very marked reduction in the case of both tube A and tube B but no diminution in tubes C and D as compared with the initial controls.

From a number of experiments of this type we concluded that the inhibitory effect of the urea-ammonium phosphate mixture is general and not merely specific for acid-producing organisms.

Discussion

The experiments described in this paper show that the rate of lactate production by salivary bacteria is greatly suppressed in the presence of salts at an alkaline pH. Comparison of the effects of ammonium and sodium salts at similar pHs clearly shows that their inhibitory powers do not differ greatly, although in most of the experiments the ammonium salts are slightly more active as inhibitors.

It has been known for many years that most ions and soluble salts are antibacterial but that high concentrations of the salts of the alkali metals (which are therefore among the least active of cations) are required for this action. Several workers have compared the antibacterial powers of sodium and ammonium salts, and they have found that the ammonium ion is very slightly more inhibitory than the sodium ion (for discussion, *see* Topley and Wilson (1948), p. 120). Our experiments on saliva show that the pH of the medium plays an important part in deciding whether or not a salt inhibits. With ammonium and sodium salts of similar pHs the slightly greater inhibitory powers of the ammonium salt in no sense suggests a specific action of the ammonium ion but merely a small quantitative difference. The position can be viewed in proper perspective when the results of Eisenberg [16] are considered. He placed 33 ions in order of ascending inhibitory power; sodium was the first—the least inhibitory—and ammonium was third on his list.

The claim of Kesel *et al.* that the ammonium ion has a specific inhibitory action on *Lactobacillus acidophilus* is based on experiments with ammonium and sodium acetates on a pure culture of the organism. Our experiments show that if certain concentrations are used, the result might suggest that the ammonium salt is inhibitory while the sodium salt is not. When a range of concentrations is studied, however, the difference in inhibitory powers is seen to be very small.

If comparisons are made between several pairs of ammonium and sodium salts then it becomes clear that although all these soluble salts are inhibitory at high concentrations, the concentration required for inhibition is less at alkaline pHs. For example, 4 per cent sodium phosphate buffers are inhibitory at pHs of about 8·0 but not if the pH is about 5·0 (*see* Table V). Also 2 per cent sodium chloride and 2 per cent potassium chloride, which have little or no inhibitory powers at acid or neutral pHs, do inhibit at pHs of about 9·0.

We believe that the effect of alkaline ammonium salts is a combination of salt action, alkalinity, and sufficient buffering power to maintain this alkalinity, and that the very slight superiority of the ammonium salts over sodium salts is due to the well-established fact that the ammonium ion is somewhat more toxic than the sodium ion. This statement is a slight modification of our previous views [4], based on saliva experiments only, in which we emphasised the part which buffers played. We now realise that at an alkaline pH, any salt, whether a buffer or not, will reduce lactate production, but unless a buffer is present the pH will become neutral or acid and inhibition will cease. The bicarbonates and alkaline phosphates are themselves buffers and if present in sufficient concentration, will maintain alkalinity, and therefore inhibit indefinitely.

Our conclusions on saliva differ but little from those of Stephan [17] who, working with 30 strains of *Lactobacillus acidophilus*, was unable to find any significant difference between the inhibitory or stimulatory effects of 5 per cent disodium hydrogen phosphate and 5 per cent dibasic ammonium phosphate when applied on filter paper discs to an agar plate containing the organisms. It is doubtful if this method is sufficiently sensitive to detect the small differences we have observed.

Bruckner [18] has drawn attention to the inhibitory action of sodium bicarbonate on pure cultures of *Lactobacillus acidophilus*, and he also found under the conditions of his experiments, with wells on agar plates, that neither sodium nor ammonium phosphate were inhibitory. He admitted, however, that the final pH of his medium was uncertain.

Convincing evidence for our view, that the ammonium ion has no specific inhibitory action, is provided by the experiment in which it is shown that urea, when added to saliva-glucose mixtures, greatly increases lactate production, despite ammonia concentrations, resulting from urease action, which steadily rose to be greatly in excess of the 50 mg./100 ml. which Kesel *et al.* claimed as inhibitory.

The efficacy of urea and ammonium-phosphate mixtures as a caries prophylactic

We do not doubt that for some time after the use of a dentifrice containing approximately 20 per cent urea and 5 per cent dibasic ammonium phosphate, the pH of the mouth and probably of the plaque remains alkaline, acid production is depressed and many organisms are destroyed. The observation of Cobe [9] already described confirms this, but it has not yet been shown convincingly that dental caries is significantly reduced.

The experiments described in this paper show that urea and salts are the effective substances and it is our opinion that the ammonium ion plays no specific part whatever. The fact that urea inhibits acid-producing mechanisms in saliva has already been noted by Stephan [14] and Muntz and Miller [19].

When mixtures of 3 per cent urea and 5 per cent dibasic ammonium phosphate are added to saliva, one effect of the phosphate is to prevent urease action, thus allowing the urea to remain undegraded. Since we have shown that urea is inhibitory to pure cultures of *Lactobacillus acidophilus* in concentrations of about 2 per cent we think that urea itself will be partly responsible for the inhibition produced by the mixture. It is clear, however, that the 3 per cent urea cannot account for the whole of the inhibition, since concentrations of urea as high as 8 per cent will not cause complete inhibition in saliva (unlike pure cultures of *Lactobacillus acidophilus*) except in the presence of phosphates.

We have no certain knowledge as to the mechanism by which alkaline phosphates reinforce the inhibitory action of urea, but there are several possible explanations. First the phosphate may act as a buffer and prevent the slight fall of pH towards the optimum for acid-production which occurs with urea alone. The acid-producing organisms are thereby maintained well on the alkaline side of the optimum pH throughout the whole experiment and have little opportunity for a vigorous metabolism at any stage of the experiment. Secondly, it is possible that at an alkaline pH, salivary acid-producing organisms may be more sensitive to urea in the same way as they appear to be more sensitive to salts. This point is difficult, if not impossible, to test on pure cultures of acidophilus, since we have found that this organism, in contrast to mixed salivary organisms, is highly sensitive to alkaline pHs alone. Thirdly, it might simply be the additive action of urea and salts at an alkaline pH. The experiments exemplified by Table XV suggest that although this may be the explanation for the additional inhibition of salts in the presence of high concentrations of urea (over 8 per cent), it does not apply to experiments with low concentrations of urea. In the latter case sodium chloride had the reverse effect, namely to increase still further the enhanced lactate production caused by low concentrations of urea.

We have as yet no experimental evidence upon which to decide between these possible explanations, but wish merely to emphasise the unimportance of the ammonium ion.

Commercial ammoniated mouth washes and tooth powders are stated to contain 22·5 per cent urea and 5 per cent dibasic ammonium phosphate as the active constituents. In test-tube experiments the ammonium salt in the mixture is unnecessary to prevent urea breakdown, since we have shown that concentrations of urea higher than 8 per cent are themselves inhibitory to salivary urease. In any case, with high concentrations of urea it is immaterial whether urease action occurs or not since, even if active, only a small reduction in urea concentration could occur and the amount left undegraded would still be above the inhibitory concentration. This state of affairs might be quite different in the mouth, however, where dilution by saliva presents an unknown and variable factor. Our experiments show that except with concentrations of about 16 per cent urea, the inhibition caused by urea is not complete but becomes so in the presence of sodium or ammonium phosphate or other salts.

If acid decalcification is an important factor in caries, then it could be predicted that these mixtures might be effective in combating the disease, since even in low concentrations they maintain the pH above 7·0. On the other hand, it must be borne in mind that the production of sufficient acid to lower the pH to a level at which appreciable quantities of enamel dissolve has been shown by Stephan and Miller [20], at least with glucose rinses, to be a process occurring within two minutes of the entrance of the sugar into the mouth. The influence of other carbohydrates on the pH of the tooth surface appears not to have been studied, but if the time relations are similar to those observed for glucose, it would seem that the fall in pH occurs very early in the course of a meal containing carbohydrates. Accordingly, the placing of an ammoniated mouth wash or dentifrice in the mouth after a meal might be too late to prevent the acid from being produced and the damage done. Stephan has shown that urea is effective in preventing a severe drop in pH if applied *before* the glucose rinse. This obser-

vation indicates that dentifrices containing urea should be used *before* a meal, a procedure which is most unlikely to gain popular acceptance. Since the frequent and continued use of these preparations appears to reduce the numbers of *Lactobacillus acidophilus* in the saliva (Cobe), it is possible that there might never be a sufficient number of organisms present in the plaque to cause the rapid fall in pH, which Stephan has shown to be so characteristic of the carious mouth after taking glucose, but this does not yet appear to have been demonstrated.

Another point which is difficult to assess is the effect of dilution of the urea-ammonium phosphate mixture which presumably occurs in the plaque in the hours following the use of the preparation. We have clearly shown that, *in vitro*, dilute mixtures of urea and ammonium phosphate, because they maintain a pH of about 7·0, greatly favour both the growth of acid-producing organisms and the production of lactate. If these organisms remain in the plaque they can do little harm, for however numerous they may be the lactate they produce is neutralised by the simultaneous production of ammonia from the urea. It seems possible, however, that the plaque under these conditions might become a neutral breeding ground for organisms, some of which might be swept to other parts of the mouth where the conditions were such that the pH might fall below the decalcifying level after the consumption of carbohydrate.

Although Cobe's results suggest that this does not happen—he reported a reduction of acidophilus counts with " low urea " dentifrices—the experiments of Keyes [21], in which the caries rate of cotton rats was actually increased by painting the teeth with 50 per cent urea twice a week, are of interest in this connection.

Many workers now believe that the first invasion in dental caries is initiated by proteolysis of enamel protein by unknown organisms, rather than by acid decalcification. If this theory is true then it is clearly impossible to predict whether urea-ammonium phosphate mixtures will be effective in reducing caries until the proteolytic organisms are isolated and their sensitivity to this mixture is determined. We have shown, however, that many species of organisms in addition to acid producers are inhibited by urea-ammonium phosphate mixtures, and cannot dismiss the possibility that proteolytic organisms are among those affected.

Summary

(1) The inhibitory action of sodium and ammonium phosphates (dibasic), acetates and bicarbonates have been compared on salivary acid-producing organisms and on pure cultures of *Lactobacillus acidophilus*. It was found, contrary to the statements of Kesel *et al.*, that these ammonium salts were only slightly more active, and this action has been related to the already well-established toxic action of salts.

(2) Other salts (e.g. sodium chloride) have been found to be inhibitory especially at pHs above 8·0. If an alkaline salt, whether of ammonium or not, is also a buffer and present in sufficient concentration to maintain the pH of saliva-glucose mixtures above approximately 8·0, conditions are favourable for its exerting maximum toxic salt action.

(3) The presence of a final concentration of 1·2 per cent urea and 2 per cent dibasic ammonium phosphate in saliva-glucose mixtures was found to be strongly inhibitory to acid production but the ammonium phosphate was replaceable by disodium phosphate.

(4) Urea alone in concentrations above about 2 per cent was found to inhibit the growth of pure cultures of *Lactobacillus acidophilus*, and since it has been found that both dibasic ammonium and disodium phosphate inhibit salivary urease it is concluded that urea itself is partly responsible for the inhibitory powers of urea-ammonium phosphate mixtures. The ammonium or sodium phosphate reinforces the inhibitory action of 1·2 per cent urea by a mechanism which has not yet been elucidated.

(5) The ammonium ion appears to play no specific part in any of these reactions.

(6) Urea alone in final concentrations of about 8 per cent inhibited salivary acid production strongly, but 16 per cent was required for inhibition to be complete. Inhibition was also complete with 8 per cent of urea in the presence of phosphates or NaCl.

(7) In contrast to the effects of high concentrations, low concentrations (e.g. 1 per cent) of urea or alkaline buffered salts have been shown to stimulate acid production in saliva-glucose mixtures and the probable mechanism of this action has been demonstrated.

(8) The possible value as a caries prophylactic of dentifrices containing urea and ammonium phosphate is discussed.

Acknowledgments

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We also wish to thank Miss Joan Dodds and Miss Nancy McLeod for skilled technical assistance. We are grateful to the Committee of the King's College Research Fund for financial support.

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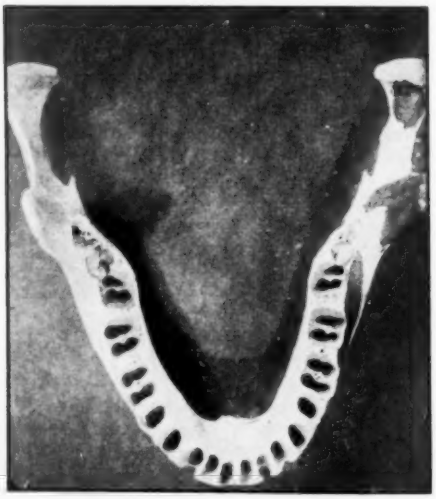
SHORT COMMUNICATION

A MODERN EGYPTIAN MANDIBLE SHOWING SUPPLEMENTARY TEETH IN BOTH MOLAR REGIONS

BY N. SALAMA, L.D.S.ENG., AND AZIZ HILMY, L.D.S.ENG.

Dental School, Cairo

THIS mandible from the collection of skulls of modern Egyptians brought from tombs at Abassia, is of particular dental interest. It belongs to an adult and the normal number of teeth had been present but were missing. On the right side of the mandible one supernumerary tooth can be seen developing in its crypt behind the third molar socket. On the left side two extra molar teeth are developing in their crypts and lying behind the third molar. Except for these abnormalities, the mandible appears to be quite normal in shape and size.



Photograph of a modern Egyptian mandible showing 9 9 10 appearing in their crypts.

EVERYDAY PROCEDURES IN DENTISTRY

SCALING

BY W. G. CROSS, M.S., B.D.S.,

Department of Periodontia, Institute of Dental Surgery, Eastman Dental Hospital

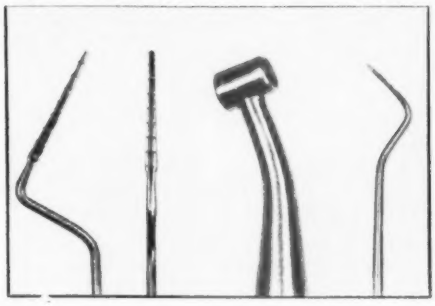
BOTH in the prevention and treatment of periodontal diseases the meticulous removal of deposits from all surfaces of all teeth is a *sine qua non*. It happens, nevertheless, that this operation is often carried out inadequately ; the author's aim, in this article, is to show that thorough oral prophylaxis should be carried out routinely, to discuss some of the instruments required and to describe their mode of action.

Few mouths are entirely free of gingival inflammation, and the sooner this is cleared up the easier are subsequent dental procedures, whether conservative or radical. It is not uncommon for perfunctory clearing of the crowns of the teeth to be carried out on completion of conservation and so on, but a far more practical measure is to reverse this arrangement; pain of endodontal origin must, however, obviously have priority.

The instruments required need not be large in number, but should be well adapted for their particular function. Those to be described are found useful by the author. The British Society of Periodontology is at present studying the question of instruments, and will in due course make some suggestions.

For detection of subgingival calculus the probe illustrated in fig. 1 is useful. It is a contra-angled double-ended caries probe, made by Dental Instruments and Accessories Ltd., and modified by stoning away the original point until only a small flat-topped projection remains. This can be introduced into pockets in any region and engages under the calculus. The other instruments shown in this photograph are two graduated probes for measurement of pocket depths (Messrs. Down Bros., Mayer and Phelps, Ltd.) and a porte-polisher.

Supragingival Calculus.—This does not present great difficulty in its removal. A push scaler of the chisel type, e.g. Ash & Co.'s E.4, is used in the



a *b* *c* *d*

FIG. 1.—(*a*) and (*b*) graduated probes for measuring depth of pockets ; (*c*) porte-polisher ; (*d*) probe used to detect subgingival calculus.

anterior region. The blade must be thin, in order to pass between closely placed teeth. Where gross interdental calculus is present in the anterior region, this instrument will often remove it all in one or two strokes. For the removal of calculus posterior to the canines, sickle scalers may be used, such as the Jacquette type—Ash and Co.'s Nos. 1, 2 and 3. These are used with a pull motion, being engaged below the mass of calculus. The instrument must be applied to the tooth at the correct angle, as shown in fig. 2.

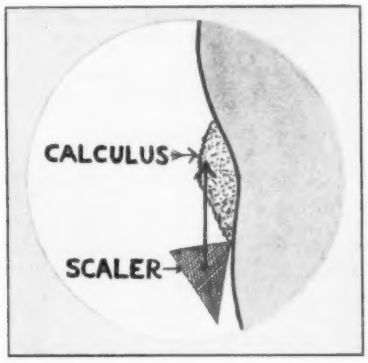


FIG. 2.—Diagram showing correct angle of scaler in the removal of calculus.

These instruments, together with some rather finer ones (Ash & Co.) are shown in fig. 3. For the removal of buccal or palatal supragingival calculus, a double-ended excavator may be used, such as Ash Nos. 127/8.

Subgingival Calculus.—The complete removal of subgingival calculus, and the meticulous polishing of the root or tooth surface afterwards, is of the greatest importance. Convenient instruments for this purpose, particularly for the buccal and palatal surfaces, but also for the approximal surfaces in the premolar and molar regions, are hoe scalers and curettes.

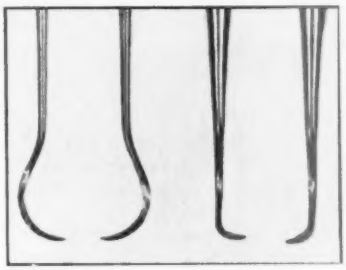
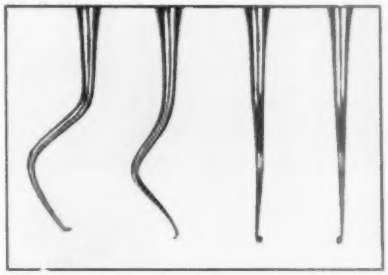


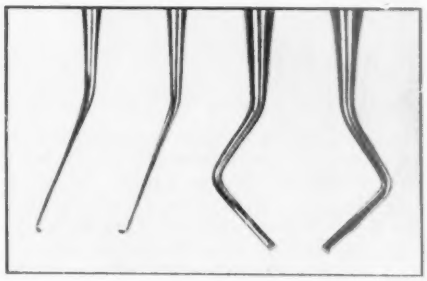
FIG. 3.—Sickle-shaped scalers.

Photographs are shown of two different designs of hoe scalers ; the McCall type, shown in fig. 4, and those by Professor Holst of Copenhagen, in fig. 5, seen both from in front and from the side.



a *b* *c* *d*

FIG. 4.—McCall scalers (*a*) No. 8 ; (*b*) No. 4 ; (*c*) No. 9 ; (*d*) No. 7.



a *b* *c* *d*

FIG. 5.—Holst scalers (*a*) No. 17 ; (*b*) No. 18 ; (*c*) No. 15 ; (*d*) No. 16.

Nos. 7 and 9 (McCall) or 15 and 16 (Holst) are for use on buccal or palatal surfaces, and to a lesser extent, approximal surfaces, of premolars and molars ; Nos. 4 and 8 (McCall) are intended for the anterior teeth, buccally and palatally, respectively. No. 8 is used also for distal aspects of teeth which have no teeth related distally. The corresponding instruments of Professor Holst's set are 17 and 18. Instruments of these types are, or shortly will be, available in Great Britain.

Curettes are also required ; in McCall's set two anterior curettes Nos. 13 and 14 and two universal Nos. 17 and 18 are suitable. These instruments are used to plane the root surface free of calculus, and are used with a pull action, engaging below the calculus. Their rounded lower surface avoids increasing the damage at the base of the pocket. For deep pockets these are probably the most suitable instruments, but much can be accomplished with the hoes.

All these instruments require to be thin in shaft, and to have a small blade in order readily to enter pockets without increasing tissue damage. As with all edged instruments, they should be maintained as sharp as possible. If sharpened free-hand on the oil stone, the original cutting angle is easily lost, and after a few times the blade so much diminishes that the instrument is valueless.

With this type of instrument, therefore, and certain others, the use of some sort of adjustable instrument holder for sharpening is invaluable. The author's modification of the Fraser instrument holder (Messrs. Cottrell) is shown in fig. 6, and the

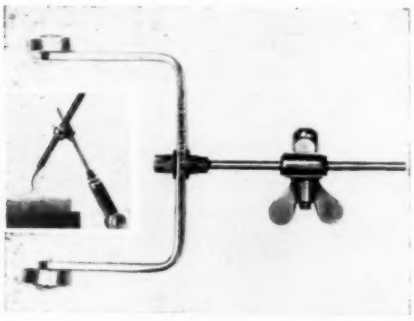


FIG. 6.—Fraser adjustable instrument holder, modified by the author. *Inset* instrument in holder in correct position for sharpening.

angle at which the instrument is set in fig. 7. In setting the instrument at the correct angle, it is viewed first from the side, and then from the front. The whole surface of the bevel must be in contact with the oil stone. The adjustment should be done before oil is placed on the stone, as afterwards it is

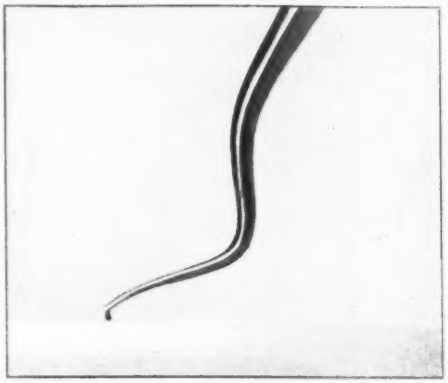


FIG. 7.—Correct angle of blade on oil stone.

impossible to see whether the bevel is in contact. Stones should be hard and of fine texture, Arkansas stones being the best. A suitable selection is shown in fig. 8.

FIG. 8.—Grooved stone suitable for sharpening curettes and excavators, triangular and cylindrical stones and mounted stone.

The triangular and cylindrical stones are valuable for sharpening those instruments with small blades or curved surfaces which cannot be sharpened on the mounted oil stone, and especially for removing the small burr, or wire-edge, which is left after honing. The sharpening of dental instruments is not easy, but pays handsome dividends in increased efficiency.

Polishing is accomplished by using linen polishing strips of various grits, small brushes, cup and wheel shape, such as the Alpine junior, rubber polishing cups of different types, and orange-wood points in the porte-polisher. All these should be used in conjunction with a polishing paste ; glycerine and pumice can be made up by the dental surgeon, though the proprietary pastes are rather more pleasant.

SCALING TECHNIQUE

In the space of this article it is impossible to do more than outline the procedure of scaling. A few photographs are shown, therefore, illustrating the

grips and positions of the instruments already described. Where practicable, the third or fourth finger should take support from firm tissues—teeth or gum—but it is sometimes useful to make use of the soft tissues, e.g. cheeks.

In fig. 9, subgingival calculus is being removed

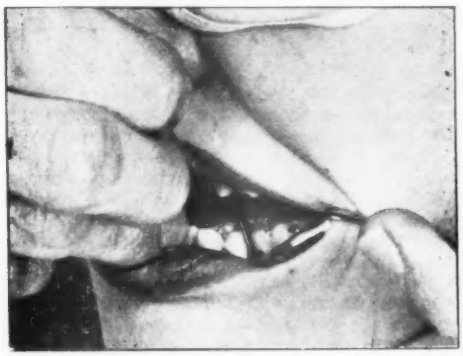


FIG. 9.—Removing calculus from bucco-distal aspect of left lower first premolar.

from the bucco-distal aspect of $\lfloor 4$. In using a hoe scaler it is important to use a two-point contact; this is between the cutting edge and cementum on the one hand, and the shank and some portion of the crown on the other. In addition the corners of the cutting edge should be a trifle rounded, in order to avoid scoring the cementum. Fig. 10

FIG. 10.—Removing subgingival calculus from mesio-buccal aspect of upper first premolar.

shows removal of mesio-buccal subgingival calculus. In the next two photographs (figs. 11 and 12), the removal of buccal and palatal calculus in the lower incisor and upper canine regions is shown. It is

FIG. 11.—Removing calculus from buccal aspect of lower incisors.

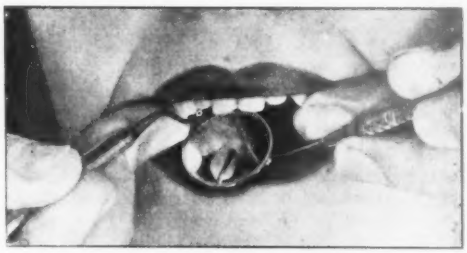


FIG. 12.—Removing calculus from lingual aspect of upper canine.

useful when scaling in the anterior region to place a folded 6 in. dental napkin in the buccal sulcus. This helps to keep the region dry and fingers, obtaining purchase on the teeth, do not readily slip.

The removal of subgingival calculus will be facilitated if a light is placed close to the gum, and a jet of compressed air is directed into the pocket by the chairside assistant. The gum is blown aside, and calculus is made visible. In some cases, however, the tissues cannot be blown aside in this manner, and here one must rely on the sense of touch, together with an absolutely systematic technique. It is recommended that all surfaces of each tooth be scaled in turn, commencing, for example, with the lower third molar and working all the way round. Only in this manner can the operator be certain that fragments are not missed. In carrying out prophylaxis it must be borne in mind that even the very small fragments of subgingival calculus are of great significance; if left they are a source of repeated trauma, not only when the tooth-brush is used or when the gum is massaged, but during mastication.

In conclusion, the reader cannot do better than study the excellent chapters upon instruments and instrumentation in Miller's "Textbook of Periodontia."

I wish to acknowledge with thanks the work of the staff of the Photographic Department of the Institute of Dental Surgery in the preparation of the photographs.

Orthodontic Notes

Serial Study of Occlusion (Birth to Ten Years of Age)

THIS study includes fifty children, without appliance therapy. To understand occlusion, records in all phases of development, including the predental stage, are necessary. Dentists should be trained to recognise departures from a good occlusion and to apply simple remedies during developmental stages. At birth the gum pads are clearly segmented to correspond to the underlying deciduous teeth : the sulci between them mark the position of the interdental papillæ except the postero-lateral, which divide the true and false gum pads : all teeth, deciduous and permanent, usually erupt anterior to this line. The lateral sulci, which become the posterior dental papillæ of the deciduous and permanent canines, can be traced from birth to maturity and are landmarks to determine the antero-posterior relation of the dental arches. Five cases are illustrated to show general principles : in one there was no occlusion of the gum pads at 3 days and the lower arch was post-normal ; at 4 months it had moved forward but was still post-normal. At 13 months the lower gum pads were still farther forward : (this continued to a marked extent up to 23 months) there was a marked horizontal and vertical overbite which is normal at this phase : prior to 18 months lateral jaw movements may be observed : the posterior gum pads are brought into contact. All teeth will erupt anterior to the postero-lateral sulci if development is harmonious and give little trouble because of the loose connective tissue : if teeth erupt posterior to this sulcus teething difficulties are experienced because of the dense connective tissue. The author says that when the first deciduous molars erupt the relative antero-posterior relationship is established and the arches assume a relatively adult position. The horizontal overbite is reduced. By testing the occlusion, displacing forces can be recognized and removed by grinding. A permanent molar erupted somewhat buccally—this was corrected by an appliance. In another case at 6 days the lower lateral sulcus was 4 mm. post-normal to the upper : in 10 months the lower had moved forward 4 mm. There was a tendency to post-normal occlusion of the lower arch so the upper buccal cusps and the lower lingual cusps were ground to allow the lower jaw to come forward. It was hoped this treatment would prove to have been a form of preventive orthodontics. In a third case, the first deciduous lower molars were removed at age 6 yrs. 2 mths. with no appreciable change in the excellent occlusion : the premolars erupted 2 years later rotated. The question is asked if premature loss is followed by rotated premolars if the space has not closed to the width of the successor. In another case there was a cleft between the upper deciduous central incisors and the space increased to 6 mm. : at 9 yrs. 7 mths. the permanent incisors were in contact. Occlusion is constantly changing during the period dealt with : periodic observation is necessary to appreciate the variations of development. A constant feature in the cases described is the progressive forward movement of the mandibular gum pads until the first deciduous molars erupt.—SILLMAN, J. H. (1948) *Amer. J. Orthodont.*, **34**, 969.

Space Closure in Extraction Cases

THE trend today is in favour of the removal of teeth in the correction of certain cases because the bony structure is inadequate. Cephalometrics support this view. The writer gives a detailed account of a method which will close spaces quickly, efficiently, and with as little harm to the tissues as any other technique. An upper removable appliance is used to move the canines distally, though later this may be replaced by a fixed appliance similar to that used in the lower. Such a plate holds the upper posterior teeth together and prevents medial drift ; it also will open the bite when necessary and take the posterior teeth out of occlusion when the lower cheek teeth are to have their axial inclination corrected. It will also keep the bite open while the lower canines are moved distally. When it is desirable to remove second premolars instead of first premolars this appliance will move the premolars, and later the canines, back. In the lower also the first or second premolars may be removed : a fixed appliance, usually only a labial one, is used with numerous bands. The canines and second premolars have edgewise bracket bands in which an arch of gauge 0·016 inch is first used, later changed to one of 0·018 inch, and thirdly one of gauge 0·021 by 0·025 inch. To avoid soreness the latter arch is ligated in place for a short time until it can safely be seated comfortably in the brackets. The headgear is used in some cases. Strict prophylaxis is required : a 2 per cent solution of sodium fluoride is applied to all the teeth before bands are cemented ; this may be repeated at intervals to the upper teeth while the removable appliance is worn. If the overbite needs to be reduced further quick setting material is added to the plate. The spaces are closed first and then the post-normal relationship treated. By this method the teeth do not have to be banded for so long. After the spaces have been closed it is important to be sure they do not open ; the canines should be ligated to the premolars and molars to avoid this. The fixed appliances are followed by acrylic retainers. A wire may run distally to the molars in order to hold all the teeth in contact. There is a tendency for soft tissue to pile up between canines and second premolars so all contacts should be closed completely before impressions for retainers are taken. The canines are guided between the buccal and lingual plates through the action of a coil spring on the labial arch. Over-expansion must be avoided and then both arches during retention should have a similar pattern to the original. All canines that are in supra-occlusion should be depressed early in treatment. If the upper canines are not fully erupted, the removable appliance makes it possible to treat them. Extraoral anchorage may be used on the lower or upper arch or both.—LEWIS, PAUL D. (1950) *Amer. J. Orthodont.*, **36**, 172.

BRITISH DENTAL JOURNAL
MARCH 6, 1951

LONDON 1951 AND 1952

At one period in the history of the British Dental Association, it had become an established custom, which had almost acquired the validity of an unwritten law, that the Annual Meeting of the Association should be held in London at least once in every five years. That custom, like so many others, was disrupted by the war, and it is now fifteen years since a full-scale annual meeting was held within the area of the Metropolitan Branch. Sir Frank Pearce was President at that 1936 meeting, and the occasion was more than usually important for, in addition to being the Annual Meeting of the Association, it was the first of what it was hoped would eventually be a series of Empire dental meetings. Delegates from most of the Associations affiliated to the parent body were present, including a large contingent of members of the Canadian Dental Association. The idea of holding periodical Empire meetings in fact originated from the Canadian Association, the first steps towards that end having been taken at the Jubilee Meeting of the British Dental Association in 1930, when the Association was officially invited to take part in a joint meeting of the two associations in Toronto in 1932. The success of that meeting, and of the subsequent more ambitious Empire meeting in London, are now matters of history. That they did much to strengthen the ties between members of the profession throughout the Commonwealth, there can be no manner of doubt. Since then, we have been able to look forward, year by year, to welcoming members of the overseas associations at annual meetings of the Association. In the short space of five years, dentists from Australia, Canada, Ceylon, Malta, New Zealand, India, Jamaica, Pakistan, and South Africa, in addition to many from the United States of America, have been welcome visitors to annual meetings.

A meeting in London always has special attractions for visitors from overseas, and those will be added to this year by those of the Festival of Britain. It is, therefore, to be expected that an even greater number than usual of our overseas colleagues will be present at the Annual Meeting in the first week of July. This will give an added interest to what promises to be a memorable occasion. The arrangements for the meeting are now well advanced and the committee of the Metropolitan Branch, who are responsible for the detailed arrangements, have made very complete plans to ensure the comfort and pleasure of members and their guests, and to make the meeting, both on the professional and social sides, a worthy tribute to the President-Elect. The omens are then propitious for the first Annual Meeting of the amalgamated Association to be held in London, and it only remains for members of the Association, for their part, to assist those responsible for the organisation of the meeting by making a point of returning the questionnaire, shortly to be circulated, as promptly as possible.

This first post-war Annual Meeting of the Association to be held in London is to be followed in 1952 by the XIth International Dental Congress, to be held in the Royal Festival Hall in London, from July 19 to July 26, 1952, at the invitation of the British Dental Association. This will bring together a large number of the most distinguished members of the profession from all over the world, and thus provide British dentists with an opportunity of repaying, in some measure, the generous hospitality which has been extended to them and their relatives by their colleagues in other countries in which previous International Congresses have been held—notably those held in Philadelphia, Paris and Vienna, in the period between the wars. It will also give dentists in this country an opportunity, which has for some years been denied to all but a few of them, of learning at first hand of the work which is being done in every branch of dentistry in other countries. Some twenty reports are to be presented to the Congress. Each of these is being given by a dentist who is himself an expert, with a world-wide reputation, in the field covered by it ; and all of them are designed as critical surveys of the progress which has been made in their particular field during the past five years. The discussion on each of these reports will be opened by two other distinguished dentists who have specialised in the subject

with which the report deals. So that in all, some sixty of the most distinguished members of the profession will take part. With a view to facilitating the discussion of these important reports, they are being published beforehand in successive quarterly numbers of the *International Dental Journal*—commencing with the issue for September 1951. These will be, in effect, an integral part of the Transactions of the Congress and, in themselves, will be a complete review of the progress of dental science and art in the past five years. In addition to this valuable series of reports, the Congress will afford its members an opportunity of seeing demonstrations by many of the outstanding clinicians in dentistry. To many members of the profession these demonstrations will be one of the most attractive features of the Congress, and, while no single member can expect to be able to see all of them, it is satisfactory to know that careful plans are being made to enable every member to see those which

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FOREWORD

This folder is intended to indicate briefly to the busy Practitioner the nature of PETRALIT — and the reasons why it is so useful.

PETRALIT is similar to tooth substance in appearance.

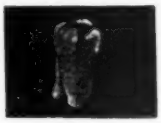
PETRALIT is harder, denser and tougher than silicates, but retains a good degree of translucency—useful in small anterior cavities.

PETRALIT does not damage the vital pulp any more than an oxyphosphate lining would.

PETRALIT has a crushing strength of over 12 tons to the square inch and its solubility is less than half of the A.D.A. requirement for Silicate fillings.

It is these qualities which make PETRALIT a truly permanent material, which will not crack under masticating stress or wash out in the fluids of the mouth, when used correctly.

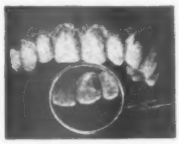
In strength and permanency, PETRALIT compares favourably with amalgam, having the advantages of aesthetic appearance, simple insertion and complete freedom from thermal shock.



OCCLUSAL & PROXIMO - OCCLUSAL CAVITIES

In these cavities PETRALIT is inserted more easily and quickly than amalgam. It is particularly preferable in lower teeth where metal fillings show up in the open mouth and in mesio-occlusal cavities in the upper premolars.

PROXIMAL CAVITIES



In incisors and canines PETRALIT is the material of choice where the bulk of the filling can be done from the lingual side or only a small labial surface is visible. Its slight lack of translucency (compared with silicates) is more than compensated by its freedom from discoloration and its permanence.

Clinical Experience shows that properly

he had been adjudged to be guilty. The fact that the Secretary of State for Scotland authorised the deduction of £1,000 from the dentist's remuneration makes it evident that the offences against the regulations were of a serious character. They were, however, apparently not so serious as to warrant a reference to the Tribunal and it is to be regretted that there should have been any departure from the hitherto accepted practice in regard to dental service committee cases. It is clear that if exceptions are made to the rule, no matter how serious the offences were, it would become increasingly difficult to avoid undesirable differences of standard being applied by executive councils as to cases in which the rule should be abrogated. We hold no brief for the dentist in question but the principle at stake is an important one.

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From the "Journal of the British Dental Association," March 15, 1901.

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From an account by Mr. F. Newland-Pedley of his work as dental surgeon in the Boer War.

LETTERS TO THE EDITOR

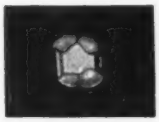
CERVICAL CAVITIES

Here metal fillings are unsightly and silicates lack permanence and are liable to wash out. PETRALIT is unique among plastic materials in combining aesthetic and lasting properties.

CLASS IV CAVITIES

Silicates lack strength and an inlay may be contra-indicated quite apart from being costly. PETRALIT is stronger than any silicate and, if properly matched (with the addition of a little grey to simulate translucency) forms a practically invisible and easily made restoration.

M.O.D. CAVITIES



PETRALIT is thoroughly satisfactory provided the cavity permits adequate bulk of the material and the contact surfaces are properly protected with wax or varnish till setting is complete. If, in rare cases, a very heavy bite which cannot be relieved causes fracture, an inlay is the only filling which will stand up to the strain.

CARIES UNDER CLASPS

Imperfect oral and denture hygiene often leads to caries under clasps. Use PETRALIT to restore these areas and avoid contact of dissimilar metals with risk of deterioration and pain due to electrolytic action. These cavities may extend right round a tooth making proper condensation of amalgam extremely difficult. PETRALIT needs no condensation and sets almost immediately.

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HEAVILY DECAYED TEETH

Where there is much tooth destruction, but strong reasons for wishing to retain the tooth, PETRALIT is the material of choice. It clings closely to the walls, and will save teeth where there is insufficient sound tooth substance to cut a retentive key for amalgam.

CHILDREN'S TEETH

PETRALIT is ideal for every type of deciduous-tooth filling. It needs the minimum of cavity preparation and is rapidly inserted. Though dryness is desirable, PETRALIT will set quickly to form a sufficiently lasting filling even if moisture cannot be rigidly excluded.

DAMAGED INLAY MARGINS

Sometimes a portion of tooth breaks away or fresh caries starts at the margin of an inlay. It may not be desirable to remove the inlay and make a new one. Repair with amalgam is risky due to the contact of mercury with gold and a cohesive gold plug is tedious. PETRALIT is the perfect material in these cases.

LOWER INCISORS

Silicates are often disappointing in these difficult areas. They wash out easily and the small amount of tooth substance gives little scope for retention. The extra strength and toughness of PETRALIT are invaluable here. Lower incisors show less than uppers so any loss of translucency is of little consequence.

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From an account by Mr. F. Newland-Pedley of his work as dental surgeon in the Boer War.

LETTERS TO THE EDITOR

REMEMBER WHEN YOU
USE PETRALIT
YOU ARE INSERTING
A PERMANENT FILLING
which lasts as long as an amalgam

To obtain the best results with any material attention to its particular technique is amply repaid. PETRALIT encourages this attention as its technique is extremely simple.

Clean out the cavity, sterilise with pure phenol in alcohol, and wipe with dry cotton wool. Leave no free moisture but do not over-desiccates by using hot air or alcohol.

A Zinc Oxide-Eugenol lining should be inserted if there is danger of pulp irritation.

Mix as rapidly as possible so as to reach the right consistency in 1½ minutes at most. The mix should be thick enough to be patted into a distinct ball.

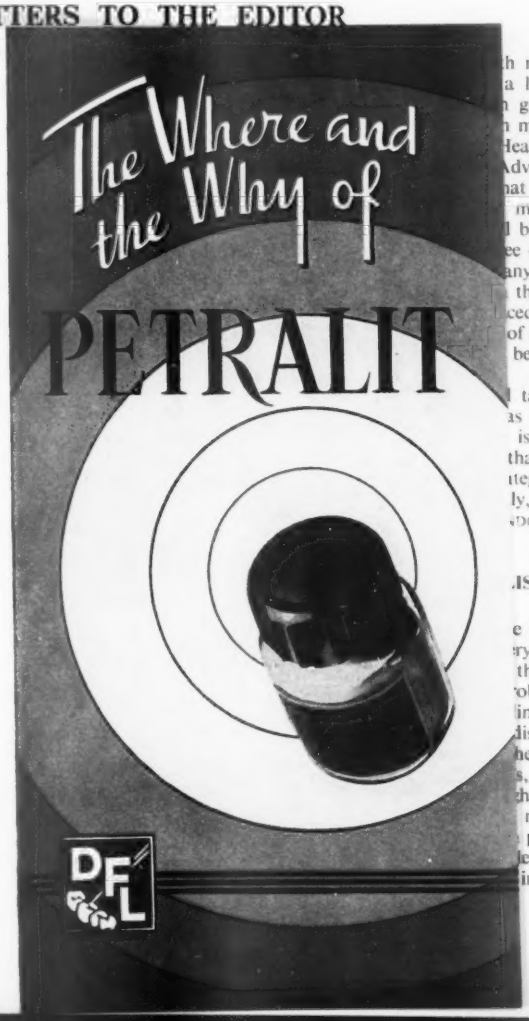
Aim at insertion in one mass with minimum subsequent working. Do not mould after stiffening has started.

Leave undisturbed for five minutes. Then protect with varnish. Final polishing can be done after 20 minutes or left till the next visit.

Use a matrix, which allows the teeth to close, so that the bite may be cleared before the filling sets and the matrix is removed. When testing the bite cover the PETRALIT with a small piece of vaselined blotting paper and let the patient bite on this.

Manufactured in England by
DENTAL FILLINGS Ltd., LONDON, N.16

P.E. 512



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NOTES AND COMMENTS

Agreement on School Dental Officers' Salaries

It has been announced by the Ministry of Health that the Dental Whitley Council (Local Authorities) of the Whitley Councils for the National Health Services (Great Britain) had reached agreement about the salaries and conditions of service of whole-time dental officers employed by local authorities. Details of the agreement are not, however, at present available but it is understood that they will be published in the near future. As soon as these are available they will be published in full in the Journal.

The School Service

The parlous state of the school dental service is the subject of a special article in *The Municipal Journal* of February 23. According to the author there are 734 whole-time officers—presumably this means that number or their equivalent—to treat 5,250,000 children. This gives an average of 7,152 children per dental officer. Eight examples of the proportion of dentists to children in the counties are given. These show ratios varying from 1—3,666 to 1—19,000, the latter being the ratio in Derbyshire with 5 dentists to 95,000 children. The article lays the chief blame for this state of affairs on the Ministry of Health but makes it clear that the local authorities are not entirely blameless. One chief dental officer, for instance, is quoted as saying that "local authorities are reaping the harvest they have been sowing for 25 years," and he went on to say that dental officers were being loyal to the children, not to the local authority. The latter, he said, had thwarted them, placing them under medical officers of health or administrative officers. They had "been supervised, standardised, victimised and paralysed." Various remedies are discussed by the author, including the New Zealand Scheme, but it cannot be said that the discussion carries the matter very much further than have other debates on the problem.

Dental Service Committee Procedure

Since the inauguration of the Health Service it has been the practice of Executive Councils that the names of doctors, dentists or pharmacists whose conduct had been the subject of investigation by a services committee should not be communicated to the Press, unless, and until, their cases came before the Tribunal. This practice was a continuation of that adopted under the old National Health Insurance procedure and found by experience to work satisfactorily. In a recent case in Scotland a departure has been made from this procedure in one case, and the name and address of a dentist who had been concerned in a series of cases before a dental service committee was given to the Press together with full details of the offences of which

he had been adjudged to be guilty. The fact that the Secretary of State for Scotland authorised the deduction of £1,000 from the dentist's remuneration makes it evident that the offences against the regulations were of a serious character. They were, however, apparently not so serious as to warrant a reference to the Tribunal and it is to be regretted that there should have been any departure from the hitherto accepted practice in regard to dental service committee cases. It is clear that if exceptions are made to the rule, no matter how serious the offences were, it would become increasingly difficult to avoid undesirable differences of standard being applied by executive councils as to cases in which the rule should be abrogated. We hold no brief for the dentist in question but the principle at stake is an important one.

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From an account by Mr. F. Newland-Pedley of his work as dental surgeon in the Boer War.

LETTERS TO THE EDITOR

ACRYLIC RESINS IN CONSERVATIVE DENTISTRY

SIR,—I am told that I have a bee in my bonnet in regard to acrylic resin filling material, such as is on the market now. I own up to this, and add that I consider it is the most useful filling material that has been given to us for many years. In point of fact, I am of the opinion that it will practically supersede all filling materials, even our beloved amalgam, gold inlay, and porcelain inlays.

Amalgam can, and will, be used if the cavity extends deeply under the gum, as a mixture of copper and silver amalgam, placed along the gingival margin, has a wonderful preservative effect on tooth substance. If plastic is used for the complete filling, I find it advisable to wipe the gingival margin with a weak solution of $AgNO_3$, and always line the cavity. The method I use for this is to take a small pellet of cotton-wool, wet it, and rub the wetted wool on to a large piece of silver nitrate. This gives the required strength, and it is well to deposit the silver salt by applying tincture of iodine.

I must not recommend that the whole incisor teeth should be always built up with plastic, or Mr. Robert Cutler will again be after my blood. I agree with him, that a beautiful porcelain jacket crown is the best restoration that we can do, but I did say in the *Brit. dent. J.*, **90**, 22, that a plastic crown has its uses these days, and even a complete jacket put on with a cellulose acetate form is a most useful procedure for an "immediate" crown that has to be in place for a lengthy time.

There are many variations to the crown I advocated in my article, which no doubt many of my confreres have found out, and Mr. Cutler's letter was very much to the point. I appreciate what he said, especially about new materials, of which this plastic filling is one of the best. I should like Mr. Cutler to publish a list of all the products he has in mind, and also give his experiences of them, as I am sure that the work he does under "private enterprise" is well known and so much is thought of it.

In reply to my query to Whitehall with reference to acrylic resin filling material, I received a letter which said that careful consideration had been given to the whole question of the use of acrylic resin materials for permanent fillings under the National Health Service, and the advice of the Standing Dental Advisory Committee, after due consideration, was that they were unable to recommend the use of these materials for permanent fillings, or that the list should be amended. I wish that the secretary of this committee could come along and see some of the work that many West End and other dental surgeons are doing with this material. I am convinced that it will have to be placed on the list in the near future, if, as the last Minister of Health said he wished, the people are to have the best dentistry available.

I hope that other dental surgeons will take up this question and help to have this rectified, as it is plainly stated in the Regulations that a cement is one which consists of a powder and liquid, other than mercury, and surely this material comes into that category.

Yours faithfully,

69, *Wimpole Street*, *London, W.1.* LINDO LEVIEN.

THE LUBRICATION AND STERILISATION OF HANDPIECES

SIR,—It is an unfortunate thing that we have to use a small and complicated piece of machinery in the oral cavity where saliva and infection make the care and sterilization of handpieces a difficult problem. For complete sterilization and lubrication, boiling in oil has been advocated, but this is not without disadvantages. The smell of hot oil is not pleasant and the handpieces must be left to drain and cool. There is, however, a simple alternative which I have used for eighteen months for my two handpieces, which continue to run perfectly and which I believe are disinfected between patients.

My method of preparing cavities includes the use of a jet of tepid water and so my handpieces inevitably get

wet. After use they are roughly dried on one particular towel and stood in a narrow jar containing 2 in. of neat Dettol. The Dettol is an excellent lubricant and a powerful germicide. It also absorbs any water left inside the mechanism. Before re-use they are dried on another towel kept specially for this purpose. The smell of Dettol is not unpleasant and the taste not too bad. It is not a caustic and so never hurts my patients' lips or mouths. The Dettol needs to be changed every two days as after that time it becomes "gummy" through evaporation, but it need not be wasted for it can be used for flushing spitoons, etc. The employment of this simple method has saved a great deal in repair bills and avoids the irritation of constantly finding one's handpieces in bad running order.

When handpieces are not in use for some days they can be left in a bath of Dettol hermetically sealed, which prevents evaporation and gumming.

Before any operation of major dental surgery the handpieces can be boiled in water and then left submerged in neat Dettol, being dried on a sterile towel before use.

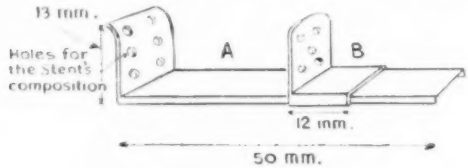
Yours faithfully,

White Lodge, H. D. HALL.
Manor Close,
Felpham, Bognor Regis.

SECTIONAL IMPRESSIONS IN ANTERIOR RESTORATIONS

SIR,—In the January 2 issue of your Journal there is an article by Mr. H. S. M. Crabb about a device for taking sectional impressions for anterior restorations.

A device as described in this article was in use in Holland some ten to fifteen years ago. It was invented by E. Flaumenhaft and Coebergh and was offered for sale under the name of Efco-afdruk lepel. I have a specimen of it, made before the war, in my possession, and I still use it, but I believe that it is no longer on the market. It will be seen from the illustration that this



Part B can be moved along Part A.

device is a little bit simpler in construction than that of Mr. Crabb's.

This provides evidence that good as the idea of Mr. Crabb is, the Dutch profession, although not known in all the countries of the world, has members who can take their place among the best.

With best wishes for you and your Journal.

Yours faithfully,

Hilvarenbeek. L. J. H. M. SICKING.

SODIUM FLUORIDE-KAOLIN PASTE

SIR,—In the "Reviews and Abstracts" section of your last issue of February 6, a paragraph on hypersensitive dentine mentions that fluorine preparations were found to cause severe pain.

I have noted this assumption of pain in connection with the use of fluorine preparations in most articles on the subject, and I should therefore like to put on record my own experience.

I have now used sodium fluoride-kaolin paste for two and a half years and have probably treated two hundred or so cases. I have only encountered three instances of pain, and in two of these the pain was only momentary.

In view of the apparent variance of this record from much published data I should be interested to know whether other practitioners can confirm my own experience.

As far as I am aware my technique does not differ in any way from that usually employed.

Yours faithfully,

"Fair Haven," D. C. SARA.
College Street,
Burnham-on-Sea.

MALMÖ DENTAL SCHOOL

SIR,—In the issue of the Journal dated February 6, 1951, under the heading "Dental Education in Sweden," page 79, it is stated that the Malmö Dental School was built by the Swedish Government at a cost of seven million pounds sterling.

During a month's stay in Sweden, last September, I was privileged to spend some time at each School and elicited, among other information, the fact that Malmö Dental School was built by the Government at a cost of 14-15 million Swedish crowns or one million pounds sterling.

I find some difficulty in correlating the report of the International Hospital Federation to the effect that Malmö School was built at a cost of seven million pounds, with that of my informant, whose authoritative statement, as chief planner and organiser of both Schools, can hardly be in question.

Yours faithfully,

27, *Wimpole Street,* RONALD J. G. GREWCOCK.
W.1.

BRAINS TRUST ON CARIES AN INVITATION

SIR,—I should be very grateful if you would allow me to draw the attention of all members to the meeting of the Southern Counties Branch to be held at 13, Hill Street, on Saturday, March 17, at 2.30 p.m. This meeting will be devoted to a Brains Trust on Dental Caries, and a panel of experts will answer questions on every aspect of this subject. This is an excellent opportunity for the busy practitioner to hear the many factors in this complex condition discussed, and to learn the latest views. The Branch extends a warm invitation to all B.D.A. members to attend, to ask questions, and to take part in the general discussion which will follow the answers to some of the questions.

Would those who hope to attend be kind enough to send their questions to me by March 10.

Yours faithfully,

4, *Clanricarde Gardens,* JAMES CAMPBELL,
Tunbridge Wells. *Hon. Programme Secretary.*

Reviews and Abstracts

RADIOLOGY OF THE TEETH AND JAWS. Including Dental Radiography for Students and Practitioners of Dental Surgery and Radiology. By Frank L. Ingram, D.M.R.D., L.D.S., M.R.C.S., L.R.C.P. Senior Assistant in the Diagnostic X-ray Department of Guy's Hospital, Lecturer in Dental Radiology of Guy's Hospital Dental School. Edward Arnold & Co. 1950. Pp. 160. Price 16s.

This is an excellent book and fills a hiatus in the text-books for the British dental student and practitioner.

It compares very favourably with several American books on the same subject, which generally are much too large and contain a mass of material not exactly relevant to the subject. It is fully illustrated. Several illustrations suffer in comparison with their American counterparts.

The layout of the book is well conceived. It is divided into two parts. One, the normal radiographic appearance; and the second part is devoted to the pathological changes which can be demonstrated by radiography.

A minor criticism is that the English is rather careless, and the author uses the term " alveolus " to describe the alveolar process, and writes of " radiological appearances " instead of " radiographic appearances."

An excellent feature of the book is that the author being a dentist himself is well able to describe the pathological background of the abnormal radiographic appearance, which adds greatly to the interest of a very readable book, full of interesting material.

The chapters on fractures are comprehensive, a feature which is absent from most of the American books.

FEHLER UND GEFAHREN BEI EINSPRITZUNGEN UND IHRE RECHTLICHEN FOLGEN. von Chefarzt Dr. Richard Goldhahn, Liegnitz, unter Mitwirkung von Oberlandesgreichtsrat i. R. Dr. Max Schlaeger. Hamburg. 1948. Ferdinand Enke Verlag, Stuttgart.

Although this book deals with the problems of local injections from a medical point of view, there is much in it which is of importance to the dentist.

Goldhahn states from his own experience, that in a big hospital he observed one infection due to an injection in 100,000 cases. Discussing the reasons for injection he says it is not desirable to keep syringes and needles in alcohol, as alcohol is not always sterile. Some investigators have found live tetanus, gas gangrene and other anaerobe-spores in alcohol. Hot air sterilisation, 160° C. for one hour or autoclave sterilisation 120° C. for a few minutes, is preferable. The instruments should be kept in a container or a towel sterilised at the same time. Another suggestion is to boil syringe and needle in water containing 2 per cent soda + 0·2 per cent formalin. To keep a syringe in a disinfectant is not considered safe, as resistant spores may survive.

The question of how to keep the drugs in solution is discussed in great detail: when opening an ampoule, an infection may occur—and has occurred—as neither the surface of an ampoule nor the files used to open it are always sterile. Rubber-capped storage bottles can be infected by pushing a needle which has been used for a preliminary injection into the solution a second time. It is claimed in this book, that owing to the temporary anoxia produced by them the addition or the use of vasoconstrictors, like adrenalin, may involve an additional risk of infection.

The authors say that should a needle break it is not advisable to " dig " for it, it should be removed surgically, the sooner after the accident the better, although the probability of " wandering " of the fragment is disputed.

An extremely rare case is described when during a blood transfusion a 14 mm. (½ in.) long piece of the needle broke, apparently inside the basilic or cephalic vein. The fragment could be held in place by pressure on the axilla and an unsuccessful attempt was made to open the vein and to get hold of the needle. Six years after the accident the fragment could be seen radiologically in the lung, but it was not causing any discomfort.

Dealing with errors in the preparation of injections Goldhahn says it is safer to use ready-prepared material, instead of having it prepared by a nurse or assistant. In his hospital nurses are only permitted to prepare a ½ per cent procaine solution; for higher concentrations ampoules are used.

Summing up, the author says that it is the exception for any damage to be caused through an injection—hundreds of thousands of injections being performed daily. 320 odd references, mostly of continental origin, are added.

The chapters by Schlaegar dealing with the legal responsibilities of the physician are of more interest to the German reader. It is pointed out that the doctor is responsible for the aseptic maintenance of materials and instruments used for local injections, also for using the right drug in the correct concentration. To give two examples, one doctor was convicted because he left the sterilising of injection material to an untrained person, in this case to the mother of a child-patient. Another physician was convicted of manslaughter, as the patient died after the injection of an overdose of cocaine. The breakage of a needle is very rarely considered negligence.

Metastatic Dysgerminoma of the Mandible.—A girl of 16 years complained of pain and numbness in the right lower jaw. Thorough investigation revealed nothing abnormal but one month later the intensity of the pain increased and the last lower right molar was found to be loose. It was extracted but the symptoms were not relieved and seven days later a vascular mass of soft tissue was found protruding from the socket. Histological examination of a biopsy specimen indicated a neoplasm but the nature of it could not be decided. A complete physical examination revealed nothing except the swelling in the region of the angle of the mandible. Radiographs of this region showed very little abnormality. The swelling, together with a large portion of the jaw, was excised. There was some improvement but a few weeks later the patient complained of pain in the back and lower limbs. She developed fever, and radiographs showed a number of dense patches in the lung and a rarefied area of bone in the ilium. She finally died about six months after the first onset of the pain in the jaw. Autopsy established that there was a dysgerminoma in the right ovary with metastases in the mandible, ilium, vertebræ and lungs.—KOSTRABALA, J. G., THURSTON, E. W., and CHAPIN, M. E. (1950) *Oral Surg.*, **3**, 1184.

Hemihypertrophy of the Face.—Dr. Kurt Heinz Römer relates a case of partial progressive facial hemihypertrophy in a female aged 27 years. The position of the left eye was considerably higher than the right and there was bulging over the left part of the forehead. The nose was twisted and the chin over-developed on the left side. This asymmetry was not noticed before the age of 14 years. The patient was of a healthy constitution and highly intelligent, all the organs of sense were normal. The thyroid was slightly enlarged ; the hands and feet were large and broad. A fronto-occipital radiograph showed the cranium to be acuminated, on the right there was bony thickening greater than that of the left ; the pineal gland was calcified ; the right orbit was oval. The left side showed less thickening, the orbit was very much higher than the right, the frontal sinus was greatly enlarged and contained several cavities, the nasal septum deviated to the right, the maxilla was broad in the zygomatic region which was distinctly hypertrophied ; the petrous portion of the temporal contained cavities with cells and the whole of the temporal was hypertrophied. The dorsum sellæ was high and in relation to the size of the skull was decidedly small. The mandible showed exostosis in the region of the ascending ramus. As there was no history of trauma or of any constitutional disease the ætiology could only be ascribed to some endocrine disturbance, according to the author a plurigland hypofunction. That the hemihypertrophy was progressing was shown by the raised blood calcium, increased ossification or calcification of the right half of the skull. An interesting comparison of the right and left halves of the face was made photographically. Two portraits were cut in half and two pictures were made by approximating the two right halves in one and left halves in the other. The result is startling—the two pictures represent two entirely different individuals ; the broad face of the right half and the long narrow face of the left. It would appear that the disturbance, whatever its nature, is confined to the left side and does not overstep the middle line.—Römer, K. H. (1950) *Dtsch. Zahn-, Mund-Kieferheilk.*, **13**, 245.

Improving Mandibular Ridge Form by Means of Surgery and Drug Implantation.—There is evidence that serum containing sulphonamide may become organised by living tissue. This is applied to the problem of the alveolar process that presents a prominence in the incisor region with a marked labial undercut which produces mechanical difficulty in the construction of dentures. Under local anæsthesia a vertical incision is made in the sulcus and a narrow gouge is inserted to produce a tunnel under the vestibular mucosa in the region of the undercut. The space is then packed with sulphonamide. This procedure has resulted in the formation of new tissue and the obliteration of these undercuts.—Hecht, S. S. (1950) *Oral Surg.*, **3**, 1096.

THE HEALTH SERVICE

NOTES FROM SCOTLAND

From our Scottish Correspondent

Scottish Health Acts Committee.—The Scottish Health Acts Committee of the Association, which was set up at the end of April last year, may now be said to have settled down to its specialised work. It meets on an average every six weeks, and its small contact committee meets representatives of the Department of Health for Scotland and the Scottish Dental Estimates Board quarterly. They are able to bring individual cases referred by members and by the L.D.Cs. to the notice of the Department and the Board, and in many cases to obtain a settlement of the differences that had arisen. The general policy and decisions of the Department, and more especially of the Scottish Dental Estimates Board, have been discussed, and as a result some measure of improvement in the operation of the General Dental Service in Scotland has been achieved.

Redating of Forms.—When, in the course of treatment, additional treatment is notified to the Board as being necessary, the Board redate the form. It has now been agreed that the time limit for treatment shall run from the more recent date.

Part 1 New E.C.17.—The Department have reaffirmed that a dentist is in no way liable for statements made by a patient in Part 1, and it has been agreed that where a patient has stated that he had not previously had treatment under the Service, while in fact he had been treated previously by the same dentist, the Estimates Board might write to the dentist asking his help in rectifying the statement, but in cases where previous treatment had been received from another dentist the Board would write to the patient.

Improved wording of Repair Schedule (Item 10).—An improved and clearer layout of this item in the Scale of Fees has been agreed; but this cannot be introduced without amendment of the Regulations. The Health Acts Committee of the Association is taking up this matter with the Ministry in London. Meantime Item 10 with its present vague and unsatisfactory wording stands.

Time limit for appeals against Decisions of the Estimates Board.—So far the Department have been very lenient in interpreting this time limit, but they have asked the Scottish Health Acts Committee to point out very clearly to the profession in Scotland that in future these time limits will have to be strictly adhered to.

Under Regulation 35 a dentist may lodge notice of appeal to the Secretary of State, and at a later date " within such period as the Secretary of State may allow " he may submit " a concise statement of the facts and contentions upon which he intends to rely." It is suggested, therefore, that if a dentist is " aggrieved by a decision of the Board," and desires to seek advice from his L.D.C. or the Scottish Health Acts Committee, he should inform them immediately of all the facts of his case ; and, even although he is not in possession of their reply, he should give formal notice of his appeal to the Secretary of State before the expiry of the time limit of one month. Having done so he is still free, after receiving the advice, to proceed with his appeal or withdraw it, as he thinks best.

Silicate Cements in Posterior Teeth.—" Conditions with respect to Materials " (1948 No. 1393 (S112)) state that silicate cements " may not be used for fillings in teeth posterior to the canines except in buccal cavities." The recent amending regulations in England substituted for the words "except in buccal cavities" the words "other than first and second premolars where the occlusal surfaces are involved " and it has now been agreed that this wording will be included in the next amendment of the Scottish regulations.

Weighted Acrylic.—The question as to whether " weighted brands " of approved acrylics are in themselves approved materials is still under discussion.

Until a decision has been published dentists would be wise, before using any of these materials, to obtain the Board's approval in each case.

It is pleasant to record that the Department of Health for Scotland has displayed a ready willingness to discuss all problems and difficulties of the Service with the profession. It must, however, be remembered that the Scottish Health Acts Committee can only function fully if Scottish members make use of its services by sending particulars, with fully documented evidence, of the many bewildering and irritating problems which confront the practitioner almost daily.

SUPERANNUATION

Part-time registrars, and hospital dental officers.

THE Minister of Health has issued a circular (R.H.B. (51) 9) in which he has designated as officers under Regulation 4 of the Superannuation regulations :

(*a*) under paragraph (1)(*f*) thereof part-time senior registrars and registrars in the employment of Regional Hospital Boards or Boards of Governors of Teaching Hospitals ; and

(*b*) under paragraph (1)(*g*) of that regulation, part-time officers, being medical or dental practitioners, in the employment of such Boards as medical or dental officers.

The operative date of the designation is December 20, 1950.

The effect of this designation is to make superannuable in their part-time capacity, all part-time registrars, and all other part-time doctors and dentists entering the service of a Board within twelve months after leaving any employment mentioned in regulation 15 (3) of the National Health Service (Superannuation) Regulations, 1950.

The purpose of part (*b*) of the designation is to ensure that any doctor or dentist who gives up general practice or some other superannuable work to join the Hospital Service in a part-time capacity in order to return to practice better equipped or with a view to becoming a registrar shall not lose any superannuation right he may have built up in his previous work.

CONSULTANTS

IN reply to a question by Mr. P. Smithers (*Winchester*), the Minister of Health, on January 29, 1951, gave the following figures showing the number of whole-time consultants in dentistry employed on December 31, 1949 (the latest information available) : Leeds 1, South-East Metropolitan 2, South-West Metropolitan 3, South Western 1, Wales 2, Birmingham 1, Boards of Governors of Teaching Hospitals 4. Total 14.

Personalia

MR. C. KERR MCNEIL, L.D.S.Glas., has been awarded the degree of Ph.D. by the University of Glasgow for a thesis on " Congenital Malformation and Acquired Deformity of the Oral and Facial Structures."

DENTAL NEWS

DINNER TO SIR WILLIAM KELSEY FRY

SIR WILLIAM KELSEY FRY, *C.B.E.*, *M.C.*, F.D.S. R.C.S.Eng., was entertained to dinner by his friends and colleagues at the Royal College of Surgeons of England on February 21. Sir Cecil Wakeley, President of the Royal College, was in the Chair and H.R.H. The Duke of Gloucester, an Honorary Fellow of the College, was among those present. The toast of Sir William's health was proposed by Mr. A. Bulleid, F.D.S. R.C.S.Eng., and supporting speeches were made by Air Commodore G. A. Ballantyne, *C.B.E.*, *D.F.C.*, F.D.S. R.C.S.Eng., and Mr. C. W. Roberts, F.D.S. R.C.S.Eng. At the conclusion of the proceedings the President presented Sir William with an album containing the signatures of all those present at the dinner.

LEASEHOLD PROPERTY (TEMPORARY PROVISIONS) BILL

PART II of this Bill, as presented to Parliament, provided that where the lease of a shop falls in during the next two years the tenant shall have the right to apply to the County Court for an extension of his tenancy for a term not exceeding one year. The County Court would fix the rent and terms of the tenancy for any additional period which they might grant in this way.

During the passage of the Bill through the House of Commons a number of attempts were made to extend this protection to dental surgeries. At the Committee Stage amendments were put down with this object in view but, in company with a number of other amendments designed to protect other interests, they were ruled out of order. Later, however, Mr. Janner (*Leicester, North West*) made particular reference to the surgeries of doctors and dentists and said that in his view people who carried on the professions had as much right to protection as the ordinary shopkeeper. Mr. Janner said, " In the dental or medical profession if a man is turned out of a surgery in a particular district it may very well be that there are no other premises available. That would work very considerable hardship upon the people who have to seek the services of that professional man."

The Solicitor-General, in replying on this point, said that the Government had decided that it was right, for the purposes of this temporary measure, to keep to shops only in order not to embark upon the very large-scale change which would probably result if they included business premises, industrial premises and all the rest. The Government thought that the repercussions which might result from such a change could be very far reaching and might have a disturbing effect. The Government were not prepared to reconsider their decision on this point.

MARKING OF GAS CYLINDERS

THE Minister of Health, in a written answer to a question asked by Dr. C. Hill said, on February 14, that a colour code and non-interchangeable valves for gas cylinders were under consideration by the British Standards Institution and the International Organisation for Standardisation. When agreement was reached urgent consideration would be given to revision of the existing British Standards.

INTERNATIONAL CONGRESS OF MILITARY MEDICINE

THE XIIIth Congress International de Médecine et de Pharmacie Militaires is to be held in Paris from Friday, June 15 to Saturday, June 23, 1951. There is to be a dental section of the Congress under the honorary presidency of Médecin General J. Bercher. Full particulars of the dental sessions can be obtained from Dr. André Boucher, 37 Rue de Rivoli, Paris IV, who will also be glad to receive offers of papers on military dental subjects to be read at the Congress.

The Schools

The London Hospital Dental School.—The Annual Dinner of the Students' Society was held at the London Hospital Medical College on Friday, February 16, with Professor A. E. W. Miles, the President of the Society, in the Chair. The toast of the Dental School was proposed by the Dental Subdean, Mr. A. M. Horsnell, who reviewed the progress and changes that have been made during the past year, and referred to the building extension programme which was now nearing completion. Replying on behalf of a number of distinguished guests, Sir William Kelsey Fry commented upon the cordial relationship that existed between the Dental School and its parent Hospital and Medical College.

On the following day, Saturday, February 17, the Dental School held its first Clinical Meeting since the war. All departments contributed displays of their work or demonstrations which were much appreciated by the visitors. Perhaps the demonstration that aroused the most interest and most favourable comment was that of the Mechanics Laboratory where the modern methods of teaching mechanics were ingeniously displayed.

Old students noted many alterations in the layout of the School and had the opportunity of inspecting the new Children's and Parodontal Departments, the construction of which is almost completed.

Leeds University.—The following appointments have been made: Lecturers in Clinical Dental Surgery, Messrs. R. T. Heylings and D. Jackson; Lecturer in Prosthetic Dentistry, Mr. C. B. Thornham.

Examination Results

University of Birmingham.—*Final L.D.S.*—D. Allan, Betty D. Astill, C. L. Brady[1] (Lawrence Carlton Prize), Alma M. Cox, D. P. Daniels, R. C. Fereday, S. I. Freedman, E. H. Gee, Mary V. Griffin, Gwendoline E. M. Harrison, M. S. Jones, P. A. Newman, L. Orton, D. C. Parker, P. D. Pinson, A. T. Pittaway, N. A. Roberts, R. C. Robinson, D. S. Shovelton,[1] R. H. N. Simkin, A. I. Spark, D. A. Stokes, K. G. W. White.

[1] Dist. Dental Surgery and Pathology.

Obituary

Robert Douglas Breen-Turner, L.D.S.Eng., of Caernarvon, died in February at the age of 65. He qualified in 1913 and afterwards practised in Caernarvon.

Percy Julian Quinton, L.D.S.Eng., of Ipswich, died on February 8, aged 70. He qualified in 1905 and had been a member of the B.D.A. since 1909.

William Scott, L.D.S.Edin., of Beith, Ayrshire, died on February 3, 1951. He qualified in 1922 and joined the B.D.A. in 1924.

The Charge for Announcements of Births, Marriages and Deaths is 2s. 6d. per Line. (Approximately 8 words.) Minimum 7s. 6d.

Births

ALLWRIGHT.—On February 7, 1951, at Kowloon Hospital, to Phyllis Margaret, wife of Walter C. Allwright, H.D.D., L.D.S., Senior Dental Surgeon, Hong Kong, a sister for Frances and Anthony.

HOGAN.—On February 11, at Cascia House Nursing Home, to Anne (*née* McWade), wife of Niall J. Hogan, M.B., B.Dent.Sc., 16, Upper Fitzwilliam Street, Dublin, a son (Quinton John James).

LAHAISE.—On February 21, at 61, The Drive, Hove, to Patricia, wife of Paul Lahaise, B.D.S.Lond., L.D.S. R.C.S.Eng., a brother for Peter (Anthony Philip).

Our Diary

Thursday, March 8.

Bournemouth and District Section.—Grand Hotel, Fir Vale Road, Bournemouth, 8 p.m., preceded by informal Dinner, 6.30 for 7 p.m. "The Nasal Sinuses." Dr. Roy Salkeld.

Brighton and District Section.—The Dudley Hotel, Lansdowne Place, Hove, 8.0 p.m. "Immediate Dentures," A. G. Allen.

Saturday, March 10.

P.D.O. Group.—The Queen's Hotel, Cheltenham, 2.15 p.m. Chairman's statement, followed by "Some Aspects of School Dentistry in New Zealand and the U.S.A.," Dr. A. T. Wynne.

Monday, March 12.

The British Society for the Study of Orthodontics.—Manson House, 26, Portland Place, London, W.1, 7.30 p.m. "Sequela of Early Loss of Deciduous Molars," E. K. Breakspear; "The Effect of the Condylar Cartilage on the Growth of the Mandible," A. J. W. Day.

Tuesday, March 13.

Bristol and District Section.—Dental Hospital, Bristol, 7.30 p.m. "Radiology in Dentistry," Dr. Frank Ingram.

The Institute of British Surgical Technicians—Dental Section.—Lecture, Eastman Dental Hospital, Gray's Inn Road, London, W.C.1, 6.30 p.m. "Reinforced Jacket Crowns," N. Livingstone Ward.

Wolverhampton and District Section.—Royal Hospital, Wolverhampton (preceded by dinner), 6.15 for 6.45 p.m. Open discussion on State Health Scheme.

Wednesday, March 14.

Reading and District Section.—Annual Dinner, Caversham Bridge Hotel, Reading, 7.30 p.m.

Western Counties Branch—North Section.—Cheltenham General Hospital, 8 p.m. "Aspects of Oral Surgery of particular interest to the General Practitioner," R. O. Walker.

Thursday, March 15.

Central Counties Branch.—Joint Meeting with Section of Odontology, Medical Institute, Birmingham, 7 p.m. "Some Nutritional Aspects of Dental Well-being," Professor A. C. Fraser.

Leeds and District Section.—Annual Meeting, Connaught Rooms, Manningham Lane, Bradford, 7.30 p.m. Social Evening.

Metropolitan Branch.—13, Hill Street, Berkeley Square, London, W1, 7.30 p.m. "Practice Problems and Predicaments—Legal and Otherwise," E. Samson.

South Wales and Monmouthshire Branch.—Royal Hotel, Cardiff, 7 p.m. "The Correction of Facial Deformities," T. G. Ward.

The University College Hospital Dental Society.—U.C.H. Medical School, 7.30 p.m. "Partial Denture on Trial," A. G. Allen.

Friday and Saturday, March 16 and 17.

Southern Counties Branch.—Spring Meeting, 13, Hill Street, Berkeley Square, London, W.1. Friday evening, Council Meeting. Saturday, 10.30 a.m., "Current Dental Affairs," H. Parker Buchanan; 2.15 p.m., a Brains Trust on "Caries."

Saturday, March 17.

Scottish Committee.—Station Hotel, Perth, 2 p.m.

Monday, March 19.

Metropolitan Branch—Finchley Sub-Section.—319, Ballards Lane, London, N.12, 8 p.m. S. S. White's Film: "Airbrasive Technique."

The Royal Society of Medicine—Section of Odontology.—1, Wimpole Street, London, W.1, 5.30 p.m. "The architectural pattern of the boundary between epithelium and connective tissue of the gingiva." R. D. Emslie.

The British Society of Periodontology.—King's College Hospital Dental School, Denmark Hill, London, S.E.5, 5 p.m. "The Elimination of the Periodontal Pocket by Pressure Packing," S. Cripps.

Wednesday, March 21.

West of Scotland Branch.—Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, C.2, 7.45 p.m. "Impression Materials and Technique," W. Malcolm Gibson.

Saturday, March 24.

North of Scotland Branch.—Royal Hotel, Dundee, 3.45 p.m. Presidential Address: "Prosthetics from Ancient Times," W. T. Whent.

Monday, April 2.

Epsom, Sutton and District Section.—Annual Meeting, Tattenham Corner Hotel, Epsom Downs, 7 for 7.30 p.m.

Tuesday, April 3.

Sheffield and District Section.—Annual Meeting, The Grand Hotel, Sheffield, 7.45 p.m.

BRITISH DENTAL JOURNAL

Communications with regard to editorial business should be addressed to THE EDITOR, *BRITISH DENTAL JOURNAL*, 13, Hill Street, Berkeley Square, London, W.1. Telephone: Grosvenor 2761. Telegrams: "Bridention," Audley, London.

Original Articles and Letters submitted for publication are presumed to be offered to the *British Dental Journal* only unless the contrary is stated.

ADVERTISEMENTS should be addressed to the Advertisement Manager, 13, Hill Street, Berkeley Square, London, W.1. Telephone: Grosvenor 2761.

BRITISH DENTAL JOURNAL SUPPLEMENT

March 6, 1951

ASSOCIATION NOTICES

BRITISH DENTAL ASSOCIATION

13, Hill Street, Berkeley Square, London, W.1.
Telegrams: "Bridention," Audley, London.
Telephone Nos.: Grosvenor 1592, 1593.
Journal Office: **Grosvenor 2761.**

XI INTERNATIONAL DENTAL CONGRESS
GROsvenor 3020

Dentists' Provident Society and Dentists' Insurance Committee. Telephone No.: Grosvenor 1172.

ANNUAL MEETING, LONDON

July 2–6, 1951

THE Annual Meeting for 1951 will be held during the week commencing July 2 under the Presidency of Mr. E. B. Dowsett.

The Scientific Programme this year will be extensive and varied. Demonstrations will be given and scientific films will be shown on Wednesday, July 4, and Thursday, July 5, and in addition a number of the London dental schools and hospitals will be "At Home" to members during the meeting and it is hoped also that it may be possible to arrange demonstration operative sessions at some of the hospitals.

During the meeting the following papers will be presented:

Symposium: "The Prevention of Dental Disease" (Professor J. Boyes, Dr. J. D. King, Mr. J. Miller).

Dr. C. Keith Simpson "Dental Evidence in the Reconstruction of Crime."

Professor E. K. Tratman "The Classification of Odontomes."

Mr. E. Gwynne-Evans "The Organisation of the Oro-facial muscles in relation to breathing and feeding."

Special papers are also being arranged by the Public Dental Officers' Group and the Hospitals Group of the Association.

The Headquarters Hotel will be the Cumberland Hotel, Marble Arch, London, W.1. The meetings will be held at the Horticultural Hall, Vincent Square, S.W.1, and further details will be published in the Journal as the arrangements are completed.

Accommodation

The Chairman of the Accommodation Committee is pleased to announce that he has now succeeded in reserving a limited number of rooms through agencies.

Applications for this accommodation should be made direct to either Messrs. Lanseair Ltd., 71, Knightsbridge, London, S.W.1, or Messrs. Thomas Cook & Son, Berkeley Square, London, W.1. Both of these firms are prepared also to book rail and theatre tickets, to meet members at the London termini and escort them to their hotels.

Demonstrations

THE Demonstration Sub-Committee welcomes application from members who are willing to contribute to the Demonstrations and Table Clinics to be held on the afternoons of Wednesday and Thursday, July 4 and 5. The programme is rapidly filling. Applicants are therefore advised that if they do not apply immediately to the Secretary of the Demonstration Sub-Committee, Mr. R. D. Emslie, Dental Department, Guy's Hospital, S.E.1, stating the title and nature of their demonstration, accommodation may not be available.

Attendance of Dental Officers

As in past years the Ministries of Health and Education, the Scottish Home Department and the Ministry of Health and Local Government for Northern Ireland, have indicated their agreement with the attendance of Public Dental Officers at the Annual Meeting, to be held in London, July 2–6, 1951. Intimations to this effect have been addressed to every local authority.

Requests have been made to regional hospital boards, to the boards of governors of teaching hospitals and universities for similar recognition of the meeting in respect of dental staffs in their employ.

GOLF PROGRAMME

MONDAY, JULY 2, 1951, AT MOOR PARK GOLF CLUB, RICKMANSWORTH, HERTS.

9.00 a.m. The Irish Challenge Cup (Bogey Competition). Entry fee 2s. 6d.; Optional sweepstake 2s. 6d.

9.00 a.m. The Pilbeam Cup for P.D.O. Group members will be played concurrently with the Irish Cup Competition, the same card counting in both competitions.

9.00 a.m. The Amalgamation Cup for past or present officials and branch officials of any of three dental organisations will be played concurrently with the Irish Cup Competition, the same card counting in both competitions.

2.00 p.m. The London Cup, Inter-Branch Competition (Medal Play) in which all members are eligible to compete.

2.00 p.m. The Scottish Cup (Medal Play). Entry fee 2s. 6d. Optional sweepstake 2s. 6d. This will be played concurrently with the London Cup, the Cup being presented to the player with the best score in the London Cup Competition.

LADIES COMPETITION AT THE ROYAL MID-SURREY GOLF CLUB, RICHMOND. MONDAY, JULY 2, 1951

10.00 a.m. The Liverpool Cup for lady members and members' wives and daughters. Competition—Medal Play. Entry fee 2s. 6d.

GREEN FEES

Green fees are, for men at Moor Park Golf Club 7s. 6d., for ladies at the Royal Mid-Surrey Golf Club 5s. The clubs have offered the use of the Club Houses to all competitors, and lunch and tea will be provided.

ENTRIES

Entries for all competitions, stating whether partner is required, should be sent to Mr. T. C. Cregan, 121, Harley Street, London, W.1.

It is hoped to give early starting times to the members of the Representative Board to enable them to be present at the meeting in the afternoon.

All members will be notified of their starting times.

BENEVOLENT FUND

The Honorary Treasurer (Mr. E. B. Dowsett) gratefully acknowledges the receipt of the following :

Donations

" Christmas Appeal " Anonymous Scot, £10 10s. ; D. Wain, £5 5s. ; Brighton, Hove and District Section Dental Group, £5 10s. 6d. ; Battersea Dental Group, £5 5s. ; Wessex Branch, £4 1s. 9d. ; Northampton and District Section, £3 3s. 6d. ; Hounslow and Twickenham Section, £3 0s. 6d. ; J. Dunlop, J. W. E. Snawdon, M. Wain, E. S. Wolfson, £2 2s. ; Ipswich, Colchester and District Section, £1 15s. ; C. T. Pomeroy, £1 7s. ; A. D. Buck, I. Cohen, R. E. Drew, W. & W. H. Walters, Wolverhampton Section, £1 1s. ; Mrs. M. Benty, 10s. 6d. ; E. M. Field, 3s. 9d.

In Memoriam C. M. Anderson

East of Scotland Dental Golfing Society, £2 2s.

In Memoriam H. Croot

R. E. Morgan, £2 2s.

In Memoriam E. Lowe

Brighton and District Section, £2 2s. ; T. G. Doig, £1 1s.

In Memoriam R. J. Messent

Brighton and District Section, £2 2s. ; H. Middleburgh, £1 1s.

In Memoriam J. T. Buchan

North of Scotland Branch, £2 2s.

Waste Amalgam

J. F. Adams, L. N. Alley, T. W. Apjohn, V. W. A. Bell-Bonnett, W. L. Breese, J. E. Brown, H. Cockbaine, C. B. Dalby, W. J. G. Dancer, W. E. Dodd, R. H. Duckham, Eastern Counties Branch, O. R. Ellis, B. H. Fillingham, G. E. Firth, Messrs. Fisher, Harrington and Cardinal, C. Ford, A. E. Hawkins, T. E. Hoggins, G. and R. Hunt, R. Lawton, A. E. Lillicrap, S. P. Meacock, Messrs. Milburn, Blackwell and Catchpole, R. C. Morgan, B. A. Morrisroe, Northern Counties Branch, C. C. B. Plumley, Miss B. H. Poole, Messrs. Purnell and Leake, Reading and District Section, P. O. Rice, O. P. Roberts, E. H. S. Seabury, D. C. Steven, H. I. Tozer, Western Counties Branch, West Lancashire Branch, F. J. Wiltshire.

By the latest sale of waste, a further sum of £83 5s. 10d. has been realised making a total of £3,444 5s. 11d. Will members who have any considerable quantity of waste amalgam kindly forward this to the Honorary Treasurer, 13, Hill Street, Berkeley Square, London, W.1, at their early convenience.

The Committee of Management desire to express their thanks to all those members who have added Benevolent Fund subscriptions when remitting their annual subscriptions to the Association.

In order to keep administrative expenses to a minimum, separate receipts for Benevolent Fund contributions are not being sent.

The Library and Museum Committee desire to express their thanks to Mr. J. M. Ney for copies of the " Ney Books," Mr. F. D. Lamb for a bound compilation of Friteau's articles, Ciba Laboratories Ltd., for a copy of " The Sex Hormones," Mr. W. R. Hipwell for a print of " The Dentist," Drs. G. Gustafson and J. E. DeWever and Mr. J. J. Hodson for reprints, Philips Electrical Co. Ltd. for a copy of Hepple X-rays, Mr. P. H. Williams for books, Messrs. R. Cutler, D. Munns, G. H. Leatherman, E. Balding, W. S. Brittan and Miss K. C. Smyth for journals, Mr. E. A. Marsland for his Thesis " Histological investigation of amelogenesis in rats."

LIBRARY

Recent Additions

Dentistry, General Works

Widdowson, T. W., and E. V. B. : Dental Surgery and Pathology, 4th edition, 1950.

Education, Dental

Canadian Dental Association : Pre-Professional Education in Dentistry, 1950.

Food, Diet and Nutrition

B.M.A. : Report of the Committee on Nutrition, 1950.

Pain

Ogilvie, Sir W. H., and Thomson, W. A. R. : Pain and Its Problems, 1950.

Pathology, Dental and Oral

Thoma, K. H. : Oral Pathology, 3rd edition, 1950.

Parodontology

Robb, H. M. : Practical Periodontia, 1950.

Pharmacology and Therapeutics

Ciba Laboratories Ltd. : The Sex Hormones, 4th edition, 1950.
Mair, W. : Scottish Chemists' Index of Modern Remedies, 5th series, 1950.

Public Health

Gruebbel, A. O. : Report on the Study of Dental Public Health Services in New Zealand, 1950.

Radiology

Hepple, G. H. : X-rays in Dental Practice, 1950.

LIBRARY

Current Periodicals Received, 1951

(The latest issues can only be borrowed if the Library has more than one copy)

Great Britain and Ireland

Anæsthesia.
Annals of the Royal College of Surgeons of England.
Army Medical Services Magazine.
Birmingham Medical Review.
British Dental Assistant.
British Dental Journal.
British Journal of Medical Hypnotism.
British Journal of Physical Medicine.
British Journal of Plastic Surgery.
British Journal of Surgery.
British Medical Bulletin.
British Medical Journal.
Bulletin of Hygiene.
Dental Delineator.
Dental Magazine.
Dental Practitioner.
Dental Record.
Dental Technician.
European Orthodontic Society. Report of Annual Congress.
Guy's Hospital Gazette.
International Dental Journal.
Journal of Anatomy.
Journal of British Dental Students' Association.
Journal of Irish Dental Association.
Journal of Royal Anthropological Institute.
Journal of Royal Society of Arts.
Lancet.
Man.
Medical Press.
Monthly Bulletin of the Ministry of Health.
Mother Earth.
Nature.
Pharmaceutical Journal.
Practitioner.
Proceedings of the Royal Society of Medicine.
Public Health.
Royal Dental Hospital Magazine.
Transactions of British Society for Study of Orthodontics.
Transactions of Medical Society of London.
U.C.H. Dental Journal.

Commonwealth

Australia

Australian Journal of Dentistry
Dental Journal of Australia.
Medical Journal of Australia.

Canada

Journal of Canadian Dental Association.
Journal of Ontario Dental Association.
Oral Health.

India

Indian Dental Review.
Journal of All-India Dental Association.
Journal of Nair Hospital Dental College.

New Zealand

New Zealand Dental Journal.
New Zealand School Dental Service Gazette.

South Africa

Official Journal of Dental Association of South Africa.
South African Dental Journal.

Foreign

Argentina

Revista de la Asociacion Medica Argentina.
Revista del Circulo de Rosario.
Revista Odontologica.
Revista de la Sanidad Militar.

Sanidad Aeronautica.
Semana Medica.

Austria
Österreichische Zeitschrift für Stomatologie.

Belgium
Archives de Stomatologie.
Documentation.
Journal Dentaire Belge.
Revue Belge de Stomatologie.

Brazil
Revista Brasileira de Odontologia.

Bulgaria
Zbolekarski Pregled.

Czechoslovakia
Ceskoslovenska Stomatologie.

Denmark
Tandlaegebladet.

Finland
Finska Tandläkarsällskapets Forhandlingar.

France
Actualités Odonto-Stomatologiques.
Annales Odonto-Stomatologiques.
Bulletin Officiel du Conseil National de l'Ordre des Chirurgiens-Dentistes.
Information Dentaire.
Odontologie.
Revue d'Odontologie, de Stomatologie et Maxillo-Faciale.
Revue Odontologique.
Revue de Stomatologie.

(To be continued.)

BRITISH DENTAL STUDENTS ASSOCIATION JOURNAL

MEMBERS of the B.D.A. can become subscribers to the journal of the British Dental Students' Association, published quarterly, at a special life subscription rate of 10s. post free. The Journal contains news of the schools and it is felt that many members of the Association will be glad to avail themselves of this means of keeping in touch with their old schools. Applications for copies on these special terms should be addressed to Mr. Charles G. Curry, Editor, *B.D.S.A. Journal*, Sandstones, 91, Hale Road, Speke, Liverpool, 19.

P.D.O. Group Notes

IT is good to know that at the Meeting of the Whitley Council on February 19 a settlement was agreed between the staff and employers' sides. What is not so good is that it is unlikely that the terms of the agreement will be made public for several weeks to come. The reasons are said to be that the secretaries of the local authorities organizations and the Ministry are very busy and that there are still some loose ends to be tied up. There is also the matter of the final draft having to go to H.M. Stationery Office for printing, and this takes time. The writer of this column has before him a picture of the signing of the settlement of the railwaymen's dispute, and it conjures up another picture—of what would happen if these railwaymen were told that their dispute was settled but that they would not be told the terms for several weeks! That P.D.O.s should not at once be told the salient points of their agreement is nothing less than mental cruelty. They have loyally waited for two and a half years for justice and they should not be kept in suspense now that an agreement has been reached. There is not the slightest doubt that our representatives are very anxious to tell us the news—so who then are the perpetrators of this piece of "red tape"?

There is to be a General Meeting of the Group at Cheltenham on Saturday, March 10, and if nothing is made known then, there will certainly be some plain speaking.

H. D. H.

Branches and Sections

East Lancashire and East Cheshire Branch.—The fourth meeting of the Session was held at the Midland Hotel, Manchester, on Wednesday, January 10.

Fifty members and thirty guests were present. The president, Mr. C. Cooke, was in the chair.

The speaker for the evening, Professor H. B. Fenn, F.D.S. R.C.S., gave an interesting paper on the Modern Trend in American Prosthetics.

Members were surprised to hear that most of the American teaching schools had discarded anatomical articulators altogether, and were using plain-line articulators only.

Extremes in America seem inevitable, and prosthetics is apparently no exception. The precise technique of the prosthodontist leading to a beautiful prosthesis, being in sharp contrast to the mass-produced prostheses of certain dental laboratories.

Questions were asked by Messrs. T. C. Rowbotham, N. H. Wood, S. H. Bourne, P. Saunsbury, Professor E. Matthews, E. R. Taylor, and C. Cooke.

After a stimulating discussion, a vote of thanks to the speaker, proposed by Professor E. Matthews, was received with applause.

The Annual Dinner and Dance of the Branch was held on Wednesday, December 6, 1950, at the Midland Hotel, Manchester, 246 members and guests being present.

East Lancashire and East Cheshire Branch.—The fifth meeting of the session was held at the Midland Hotel, Manchester, on February 6, 1951.

The president, Mr. C. Cooke, was in the chair and forty-six members and three guests were present. Dr. E. C. Easson gave a talk on "The Medical Aspect of Atomic Warfare," in which he gave an authoritative account of the types of casualties produced by an atomic bomb explosion, and of the steps which could be taken to minimise its effects. Numerous slides were shown to illustrate the manner in which the bomb exploded and the damage and casualties it could cause.

Questions were asked by the president and Messrs. J. A. Humphreys, E. R. Taylor, P. R. Lewis, and F. A. Howarth.

A vote of thanks was proposed to the speaker by Mr. S. S. Doran who hoped that wise councils would prevail in the world.

When the films "Silicate Cements" and "Dental Amalgam failure due to moisture contamination" were shown at the branch meeting in October 1950, it was suggested that they would be of considerable interest and value to dental attendants. A special meeting was therefore arranged on January 22 1951, at 7.45 p.m., in the Dental Hospital, Manchester, at which Mr. J. K. Holt again presented these films. Fifty-one dental attendants availed themselves of the invitation extended to them.

Members of the Branch were invited to be present at a meeting of the British Society of Periodontology, held at the Dental Hospital, Manchester, on February 12, 1951. Those who accepted enjoyed a most interesting meeting at which a casual communication "Observations on a case of Occlusal Trauma" was presented by Mr. J. Harrington and a Paper on "The Local Causes of Periodontal Disease" was read by Mr. A. F. Stammers.

South Wales and Monmouthshire Branch.—A Meeting of the Branch was held at the Mackworth Hotel, Swansea, on Friday, January 26, 1951. The President, Mr. Jackson Partridge, was in the chair. Mr. T. Leaver gave a very interesting and illuminating address on "The Working of the Dental Estimates Board." The address was much appreciated. Many questions were asked and ably answered, and many difficulties of practitioners were ironed out. Mr. Leaver was accorded a vote of thanks on the proposal of Mr. G. D. Lloyd.

Worthing and Brighton Sections—Conjoint Meeting.—The February Meeting of the Brighton Section and Worthing Section took the form of a Conjoint Meeting held in the Worthing Squash Club, West Worthing, on February 19. The meeting was preceded by a dinner at the invitation of the Worthing Section, about forty members, eighteen from Brighton, being present. Later Mr. H. A. Pitt Roche read a Paper on "Jacket Crowns." This was illustrated by a magnificent colour film, and Mr. Pitt Roche answered numerous questions.

Following a unanimous vote of thanks to the speaker, the Chairman of the Brighton Section (Mr. W. R. Keizer) thanked the Chairman of the Worthing Section (Mr. W. Scoble) and the Worthing members for their wonderful hospitality and hoped that the Brighton Section might have the pleasure of returning the visit next year.

Brighton and District Section.—The Annual Dinner of the Section was held in the Dudley Hotel, Hove, on Friday, February 23, 1951.

One hundred and fourteen members and guests were present—a record. The Chairman, Mr. W. R. Keizer, presided and the distinguished guests included Mr. A. J. Hill Perry, Mayor of Hove, Mr. Howard Johnson, Member of Parliament for the Kemp Town Division, Brighton, Dr. Alexander Hall, Chairman of the British Medical Association (Brighton Division), Dr. J. H. Le Brasseur, President of the Brighton and Sussex Medico-Chirurgical Society, Mr. J. Lauer, Vice-Chairman of the Council, B.D.A., Mr. B. S. Mead, President of the Southern Counties Branch, B.D.A., together with the heads of other local learned societies.

The Toast of the British Dental Association was proposed by Commander William A. Smith, United States Navy. This was responded to by the President of the Southern Counties Branch.

The general opinion was that the function was one of the most enjoyable, and most successful, of recent years.

Correspondence

Pay of Medical and Dental Officers.—Your correspondent on Service pay appears to be confused as between duty and responsibility. Being well acquainted with Service conditions I am not at all impressed that a medical officer should have to spend night hours in attendance while flying is in progress. Leaving aside the possibility that such an occupation, to anyone choosing a Service career, might well be more interesting than peering down a succession of throats, it is his duty to be present. If he were not it would be the duty of others to enquire why, responsibility does not start unless and until a case presents itself. It is open to question whether this responsibility is any greater than that of the pilots, control men or even the N.C.O.s who give their word that aircraft maintenance is correct. The medical officer and your correspondent are paid more than any of these men.

When your correspondent fulfils his responsibilities every twenty minutes, six hours a day for five and a half days a week and when he carries out this work to the best of his abilities, which cannot be supervised, and whenever the opportunity presents itself he need have no fear that they are any less onerous than those of a medical officer. Men on fixed incomes who can be relied on to fulfil their responsibilities continuously and without supervision—the position of most dental officers—as they are trained to do, are by no means common in any organisation and not more so in the Services. When your correspondent is fulfilling those conditions he is earning every penny he gets and deserves any more with which the Treasury can be persuaded to part. His rate of pay is high in relation to other branches because of the slower rate of promotion and the lack of opportunity for high rank. He is paid less than the medical officer because in the past their organisation was powerful enough to demand a high rate ; it has nothing to do with relative responsibility or professional pride. In the past the profession was glad to tag on behind the medical officer but there is no longer any need for perpetuating that state of affairs.—I. D. HODGSON, 12, *Skeena Hill, Southfields, S.W.*18.

The Scale of Fees.—The paragraph quoted in your Editorial from the Report of the Auditor-General should be carefully considered by all dentists.

The indication is clear. Another attack on fees is about to be launched.

Can one do good dentistry at fees considerably lower than the present generous scale ?

This time, get out of that apathy and really do something about it. There will not be a second chance.—R. G. TORRENS, "*Woodside*," 85, *Wimborne Road, Winton, Bournemouth.*

The Prospect for the Profession.—As the second half of the century opens, I feel that it is a good moment for the profession to consider seriously the prospect which opens out before us.

On the one hand we have the possibility of "simple treatment" being placed in the hands of dental auxiliaries.

On the other, a suggestion of certain of our "enlightened brethren" that prosthetic work should be transferred to technicians.

The Dental Estimates Board by its continual pressure and the tightened bonds of red tape will very shortly effectively remove all the more advanced conservative techniques.

We are left with simple fillings and extractions.

If the vital periodontal tissues are to be left to the tender mercy of the dental auxiliaries under the heading "simple scaling" it is quite evident that the only remaining operation for us to do will be the mass extraction of teeth.

As it costs considerably more to get one's hair cut than we are paid for extracting a tooth, had we not all better train as hairdressers and have done with dentistry ?—K. MACLEOD DORNING, *Chine Corner, Flaghead Road, Canford Cliffs, Bournemouth.*

CHANGES OF ADDRESS

Notices of Members' Changes of Address should be addressed to the general office of the Association, and not to the Editor or the Journal Office. To avoid errors, name and both addresses should be written in block letters.

(N.I.) ALEXANDER, T. E., from Kenmore, Thomas Street, to 7, Howard Terrace, Dungannon, N. Ireland.

(E.C.) ALLEN, R. B., from 105, to 2*s*, Rosewood Avenue, Elm Park, Romford, Essex.

(E.S.) ANDERSON, F. S., from 22, Belford Avenue, Edinburgh, 4, to 23, Ferry Road, Edinburgh, 6.

(N.C. to E.M.) ARMITAGE, M. (Miss), from 4, Oaklands, Gosforth, Newcastle-on-Tyne, to 3, Cranmer Street, Nottingham.

(S.C.) AUDSLEY, C. W., from 1, Clyde House, Dover Street, to Garden Flat, New Lodge, St. John's Park, Ryde, I.O.W.

(E.C.) BAINES, C., from the Gables, Stanfield, to Beech House, High Street, E. Dereham, Norfolk.

(S.C. to —) BARNETT, J. D. W. (Captain, R.A.D.C.), from Depot and T.E., R.A.D.C., Duke of Connaught Road, Aldershot, to Medical Officers' Mess, 30 Field Ambulance, B.A.O.R.16.

(S.C.) BELL, J. B., from 7, Cheston Avenue, Shirley, Surrey, to 70, Croydon Road, West Wickham, Kent.

(N.I.) BLACK, R. Y., from 63, Main Street, to 38, Hamilton Road, Bangor, Co. Down, N. Ireland.

(W.S.) BOSTON, S., from 5, Chisholm Street, Trongate, Glasgow, C.1, to 143, King's Park Avenue, Glasgow, S.4.

(E.S.) BOULOUX, J. S. L., from 3, Palmerston Place, Edinburgh, 12, to 30, Sprouston Road, Newtown, St. Boswells, Roxburghshire.

(W. to S.C.) BOURNE, T. G. A., from 540, Bitterne Road, Bitterne, Southampton, to Windsor Hotel, Folkestone, Kent.

(N.I.) BOYD, J., from 94, Castlereagh Street, to 20, Brookvale Avenue, Antrim Road, Belfast.

(S.C.) BURN, B. R., from Yardley, Church Way, W. Tarring, Worthing, to 32a, St. Michael's Road, West Worthing, Sussex.

(E.M.) CHETTLE, N. E., from 102, Kent Road, Mapperley, to 180, St. Anne's Well Road, Nottingham.

(W.S.) CHRYSTIE, R. A., from 32, E. Princes Street, to 9, Argyle Place, Rothesay, Bute, N.B.

(N.I.) COATES, H. A., from 385 to 411, Newtownards Road, Connswater, Belfast.

(E.C.) DICKENS, J. J., from Edgware General Hospital, Edgware, Middx., to 61, Trinity Street, Gainsborough, Lincs.

(C.C.) DRAYCOTT, R. J., from 83a, Edmund Street, Birmingham, 3, to 4, Greenfield Crescent, Edgbaston, Birmingham, 15.

(M.) ELLIOTT, J., from 154, Leytonstone Road, to 154 High Road, Leytonstone, London, E.15.

(M.) FARREN, D. W., from 108, Stoke Newington Road, to 66, Stoke Newington High Street, London, N.16.

(E.C.) FIELD, E. M., from 66, Baker Street, to 35, Darkes Lane, Potters Bar, Middx.

(E.M.) FILLINGHAM, S. B., from 3, Crown Hill's Rise, to Sherwood, Station Road, Scraptoft, Leicester.

(M.) FORREST, J. O., from 49, Edgware Road, London, W.2, to 25, Upper Wimpole Street, London, W.1.

(E.C. to W.C.) FORRESTER, W., from 37, Burleigh Street, Cambridge, to 11, King Street, Hereford.

(E.C.) FREEMAN, P. E., from 25, Collingwood Road, to 18, Regent Street, Great Yarmouth, Norfolk.

(E.S.) GIBSON, W. A., from Rowanbank, George Street, to South Bridge Street, Bathgate, W. Lothian.

(Y.) GLEEK, I. H., from 48, Manor Grove, Leeds, 7, to 401, Harehills Lane, Leeds, 9.

(S.C.) GOFFE, M. L., from 76, Kingston Hill, to 10, Fairfield West, Kingston, Surrey.

(M.) GRIMSON, A. S., from 159a to 62, Wandsworth High Street, London, S.W.18.

(Y.) HALL, G., from 100, Staniforth Road, Sheffield, to The Lookout, Knedlington, Howden, Near Goole, Yorks.

(S.C.) HANDY, A. H., from Dunfallandy, Parsonage Road, Englefield Green, to 60, The Crescent, Southwick, Near Brighton, Sussex.

(W.C.) HILTON, C. N., from Talgarth, Higher Yannan Drive, to 29, Orchard Gardens, Teignmouth, S. Devon.

(S.W.) HOOPER, E. T., from 15, Gower Place, to 35, King's Road, Mumbles, Swansea.

(W.S.) HUMBLE, B. H., from 36, Berkeley Terrace, to 91, Berkeley Street, Glasgow, C.2.

(W.S.) JOHNSTON, J., from 31, to 57, Stirling Street, Airdrie, Lanarks.

(E.L.) KENNEALY, B. A., from 447, Blackburn Road, Bolton, to 73, East Road, Longsight, Manchester.

(W.C.) KNOWLES, L., from 2, to 457, Soundwell Road, Kingswood, Bristol.

(E.C.) LEACH, R. F. H., from Ty Gwyn, Green Lane, to 1, Whalebone Lane South, Becontree Heath, Dagenham, Essex.

(M. to S.C.) LEGGETT, L. J., from 25, Avenmore Gardens, London, W.14, to 27, Oaklands Road, Bromley, Kent.

(S.C.) LEVER, W. K., from 33, Fourth Avenue, Hove, to 67, Lewes Road, Brighton.

(M.) LESTER, A. (Major), from 37a, St. John's Road, to 6a, St. John's Hill, Clapham Junction, London, S.W.11.

(Y. to E.M.) LYCETT, J. S., from 212, Eccleshall Road, Sheffield, 11, to 4, Kingsbridge Terrace, Dale Road, Matlock, Derbyshire.

(S.C. to E.C.) MARTIN, C. R., from Sunnyside, Elwick Road, Ashford, Kent, to Brundish, Near Woodbridge, Suffolk.

(E.C.) MATTHEWS, B., from 75b, to 103a, South Street, Romford, Essex.

(W.S.) MILLIGAN, J. C., from 10, to 4, Church Street Dumbarton.

(Y.) MOFFAT, J. P., from Halmai, Leeds Road, Rawdon, to 61, Thorpe Lane, Guiseley, Leeds.

(E.C.) MORRIS, A., from Abbey View, to 117, Weedon Road, Northampton.

(Y.) MORRIS, C. J., from 54, Leopold Street, Leeds, 7, to 587, Dewsbury Road, Leeds, 11.

(N.I. to W.S.) MURRAY, F. D., from Royal Army Dental Corps, Ballykinler Camp, Co. Down, N. Ireland, to 31, Kethers Street, Motherwell, Lanarks.

(M.) OLIVER, B. A., from 4, Spencer Hill, to 5, Burghley Road, Wimbledon Common, London, S.W.19.

(M.) OLIVER, B. A. (Mrs.), from 4, Spencer Hill, to 5, Burghley Road, Wimbledon Common, London, S.W.19.

(W.S.) OWENS, A. S., from 10, Graham Street, to 12, Broomknoll Street, Airdrie, Lanarks.

(W.S.) PERPOLI, J. K., from 1349, Pollokshaws Road, to 116, Kenilworth Avenue, Shawlands, Glasgow, S.1.

(W.S. to N.C.) RATTRAY, P., from 14, Hill Road, Stonehouse, Lanarks., to 37, Hawthorn Terrace, Durham.

(E.C.) REED, W. C., from Heatherlea, Church Road, Saxilby, to 65, Montague Street, Lincoln.

(W.C.) REVELL, H. H., from 3, Thornbury Park Avenue, Peverell, Plymouth, to Ainslie, Yealm Road, Newton Ferrers, S. Devon.

(S.W.) RICHARDS, T. I., from Welsh Board of Health, Cathay Park, Cardiff, to Morriston Hospital, Morriston, Swansea, Glam.

(N.I.) ROBB, A. W., from 98, Hill Street, to 7, Trevor Hill, Newry, Co. Down, N. Ireland.

(E.C.) ROBINSON, C. J., from 1, Wentworth Street, to 63, Broadway, Peterborough.

(M.) ROWINSKI, T. F., from 8, Beauchamp Place, London, S.W.3, to 5, Cumberland House, Kensington Court, London, W.8.

(—) RYAN, E., from Kilmurry, Ballygran, Charleville, Co. Limerick, to 14, Bridge Street, Tralee, Co. Kerry, Eire.

(N.C.) SEARLE, W. S., from Dairy House, Wesley Terrace, Sherburn Hill, to 44, North Road, Durham City.

(W.L.) SHENTON, F. C., from Solway, Windsor Mount, to Grove House, Grove Mount, Ramsey, I.O.M.

(W.L.) SILCOCK, H. O., from The Cross, to 1, Stanley Road, Huyton, Liverpool.

(E.L.) STURLEY, J. A., from 314, Oldham Road, Manchester, 10, to Thornage, Alton Road, Wilmslow, Cheshire.

(Y.) TAYLOR, R., from 29, Corporation Buildings, Snig Hill, to 21, Causeway Head Road, Sheffield.

(S.W.) THOMAS, J. R. P., from 4, Abbey Terrace, Llandilo, to Burton Chambers, King Street, Carmarthen.

(C.C.) THOMPSON, W. B., from 24, Allerton Road, to 22, Margaret Avenue, Trentham, Stoke-on-Trent.

(S.C.) TITCOMB, C. C., from 4, Roschill Terrace, to 1 Braeside Avenue, Patcham, Brighton, 6.

(C.C. to W.L.) WATSON, E. H., from 306, Vicarage Road, Kings Heath, Birmingham, to 75, Clifton Drive, Lytham St. Annes, Lancs.

(N.S. to E.S.) WATSON, W. G., from 16, Crails Lane, St. Andrews, Fife, to 27, Newmarket Street, Falkirk, Stirlingshire.

(M.) WHITEHEAD, K. M. (Miss), from 5, Scarth Road, London, S.W.13, to 7, Hillsleigh Road, London, W.8.

(M. to S.C.) WILSON, H. E., from 51, Sterndale Road, London, W.14, to 80, Granville Road, Sevenoaks, Kent.

(E.L.) YOUNG, T. C., from 611, Broadway, Chadderton, Oldham, to 79, Rochdale Road, Royton, Lancs.

CANDIDATES FOR MEMBERSHIP

(M.) AKNIN, Andre, Dip. d'Etat Chir. Dent. Paris, 85 86, New Bond Street, London, W.1.
Nominated by : A. E. Moss, R. S. Palmer, H. Tuxford.

(M.) BARNETT, Raymond Derek, L.D.S.Eng., 10, Queen's Gardens, London, W.2.
Nominated by : R. H. Fader, J. B. Jenrick, P. E. Gerrard.

(E.C.) BELFIELD, Gavin, B.D.S.Manc., 5, De Parys Avenue, Bedford.
Nominated by : C. Cooke, Miss P. Andrew, J. K. Holt, H. A. Gillett.

(W.S.) BENNET, Thomas MacLaren, L.D.S.Glasg., 4, New Street, Paisley.
Nominated by : J. Aitchison, H. A. Anderson, T. C. White, J. A. Orr.

(W.L.) BUCKLEY, Cathal Patrick, B.D.S.Irel., 13-15, Seymour Street, Liverpool, 3.
Nominated by : R. G. Uchotski, Sir Percy Macdonald, G. A. Parks.

(N.C.) CAMPBELL, Beatrice Ross (Miss), L.D.S.Edin., 386, Norton Road, Stockton-on-Tees, Co. Durham.
Nominated by : C. V. Armitage, P. G. Rideal, G. R. Moffoot.

(W.S.) CLARK, Ian Duncan, L.D.S.Glasg., 5, Charing Cross Mansions, Glasgow, C.2.
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Nominated by : B. L. Evans, H. A. Bull, J. A. MacLeod.

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(W.L.) SELWYN, Peter, L.D.S.Eng., Caldy, Whiston Lane, Prescot, Lancs.
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Nominated by : W. Harford, J. A. G. Wilson, T. L. Henderson.

(S.C.) SMITH, Christopher James, Dentists Act, 10, Woodside Road, Sutton, Surrey.
Nominated by : H. C. Scott, D. M. Christie, M. A. G. Simpson.

(N.I.) STEWART, James Craig, L.D.S.Irel., The Diamond, Magherafelt, Northern Ireland.
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(E.C.) SUNAWAY, Keith Scott, L.D.S.Eng., 85, Oxford Road, High Wycombe, Bucks.
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(E.S.) TUCKER, Petrie, L.D.S.Edin., 83, Congley Bank Road, Edinburgh, 4.
Nominated by : R. G. Maclean, P. Brown, E. S. Woodburn.

(E.C.) WANT, Gerald James Lee, L.D.S.Eng., 34, Pauline Crescent, Whitton, Middlesex.
Nominated by : L. F. Ferguson, W. B. Purnell, J. A. Macdonald.

(E.S.) WATERSTON, William, L.R.C.P.&S., L.D.S.Edin., 3, Morton Hall Road, Edinburgh, 9.
Nominated by : M. C. K. Finlayson, W. P. Baxendine, A. G. Davidson.

(S.C.) YATES, Albert Vernon, Dentists Act, Duffields, West lands Grove, Portchester, Hants.
Nominated by : E. O. Day, R. V. Kinroy, J. P. Davies.

(W.C.) YEARN, Ruth Annie (Miss), B.D.S.Brist., 123, Whiteladies Road, Bristol, 8.
Nominated by : Professor A. I. Darling, L. E. Claremont, J. W. E. Snawdon.

Candidates for Readmission.

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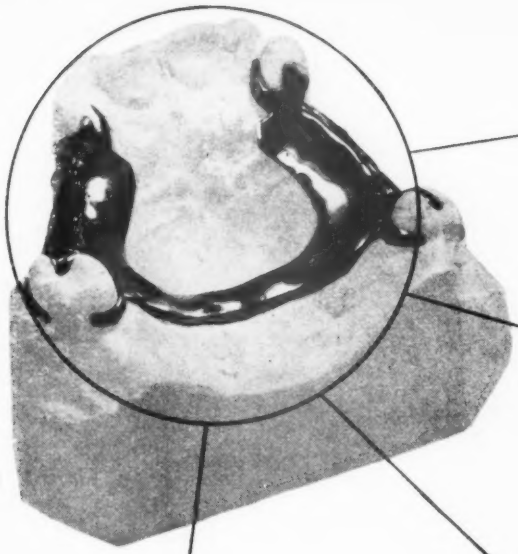
Nominated by : Mrs. O. E. Foulds, Mrs. S. McDonald, R. L. V. Henderson.

(W.L.) MARTYN, Roy Samuel, L.D.S.Lpool., 199, Warbreck Drive, Blackpool.
Nominated by : F. E. Lawton, G. E. Myers, J. H. Martyn.

(W.S.) TURNBULL, Patrick Joseph Mullan, L.D.S.Glasg., 40, Eldersile Street, Glasgow, C.3.
Nominated by : J. Thomson, T. B. Henderson, J. A. Orr.

FORTHCOMING MEETINGS AT HEADQUARTERS

March 5	Health Acts Committee	9.30 a.m.
,, 10	Finance Committee...	10.30 a.m.
,, 16	Advisory Committee on Research... ...	10.00 a.m.
,, 16	Grant-in-Aid Committee	2.30 p.m.
,, 17	Hospitals Group Committee	10.00 a.m.
,, 19	Priority Classes Committee	10.30 a.m.



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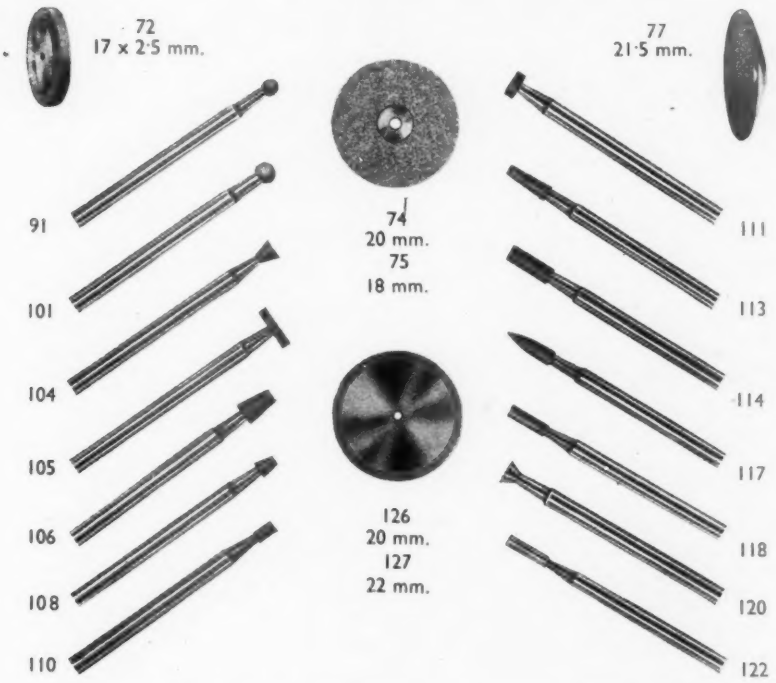

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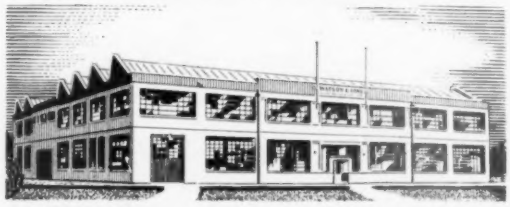

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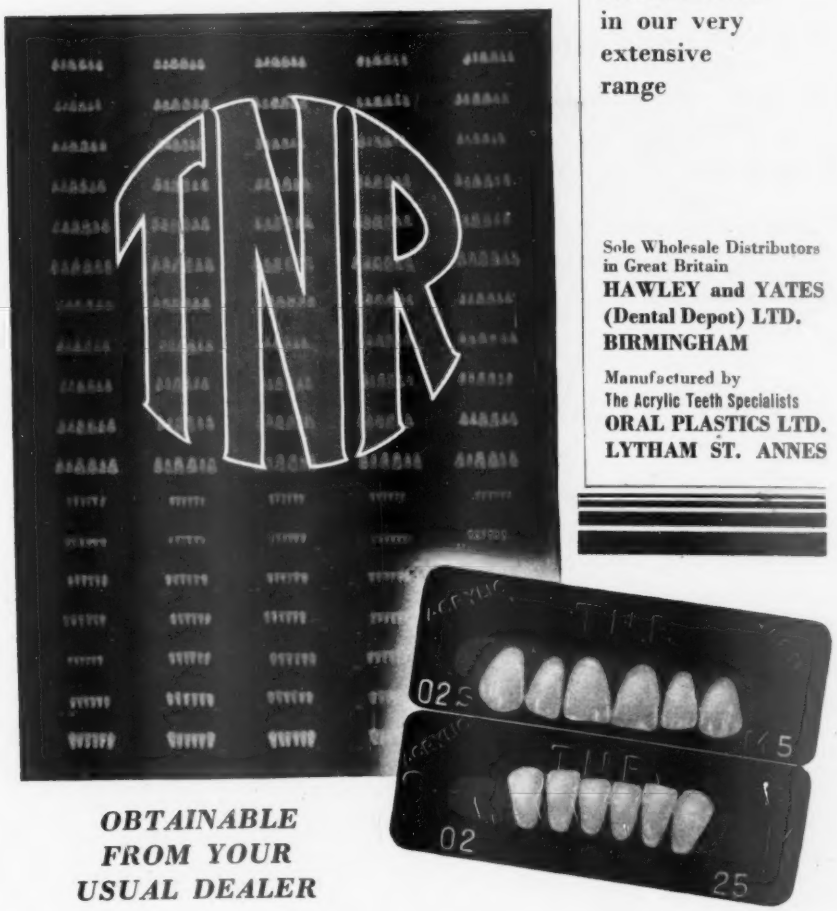

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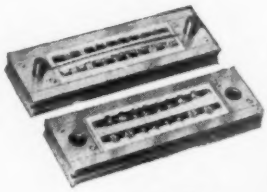

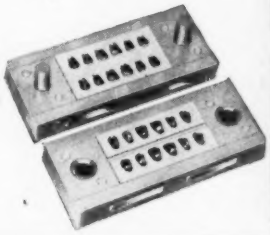

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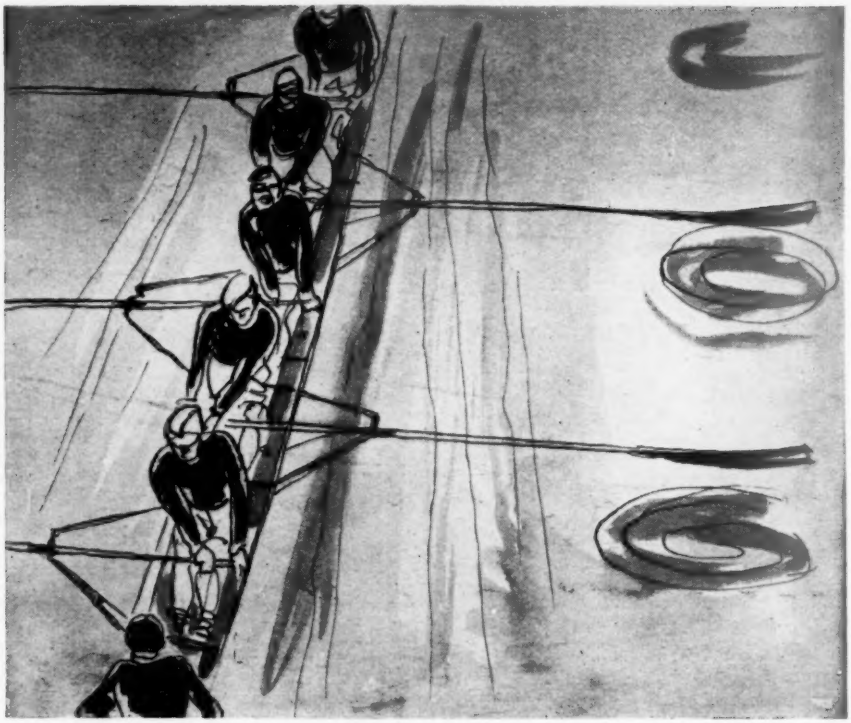

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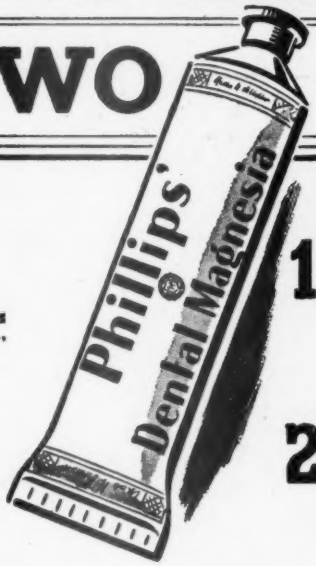

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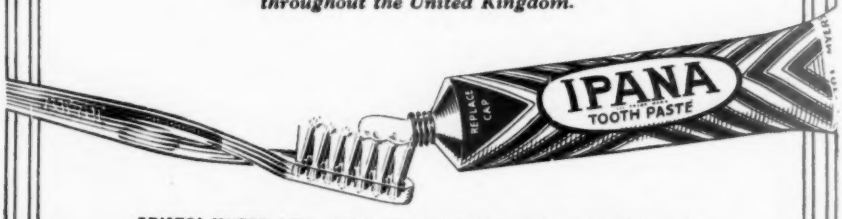

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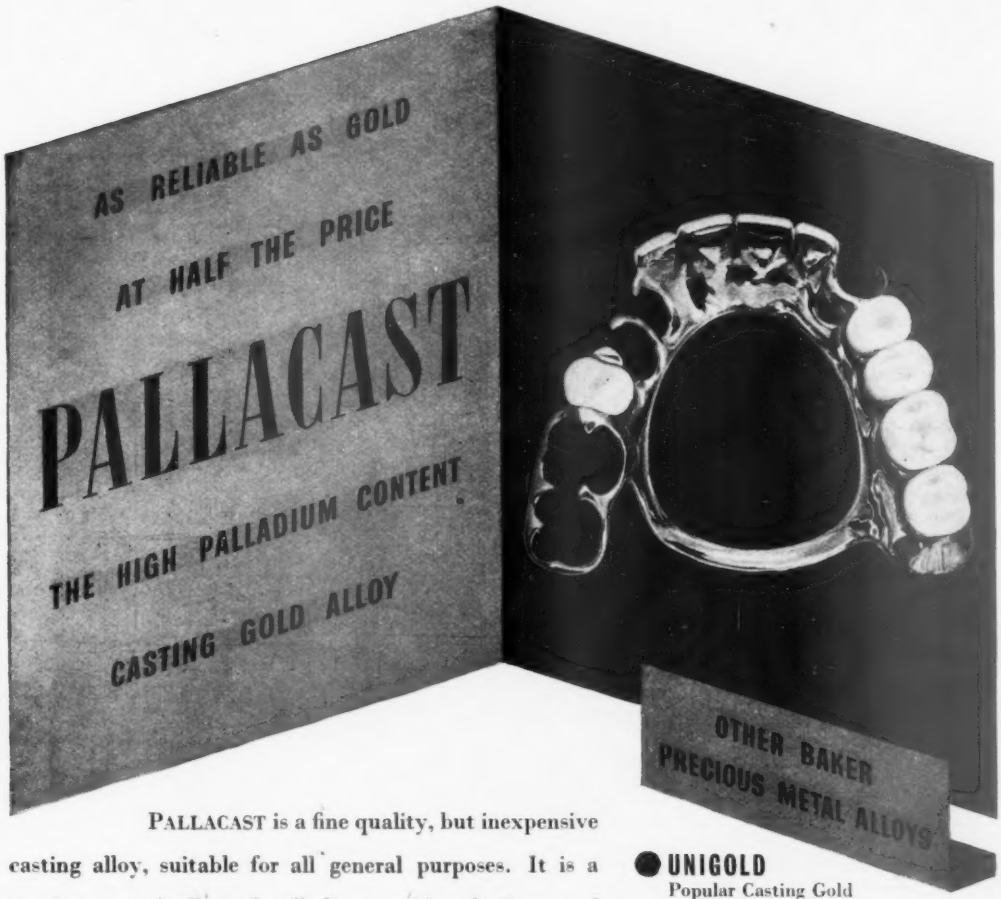

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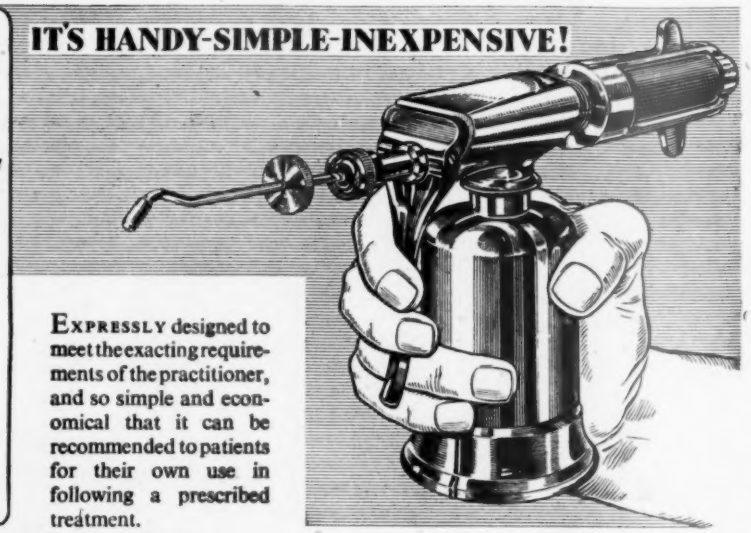

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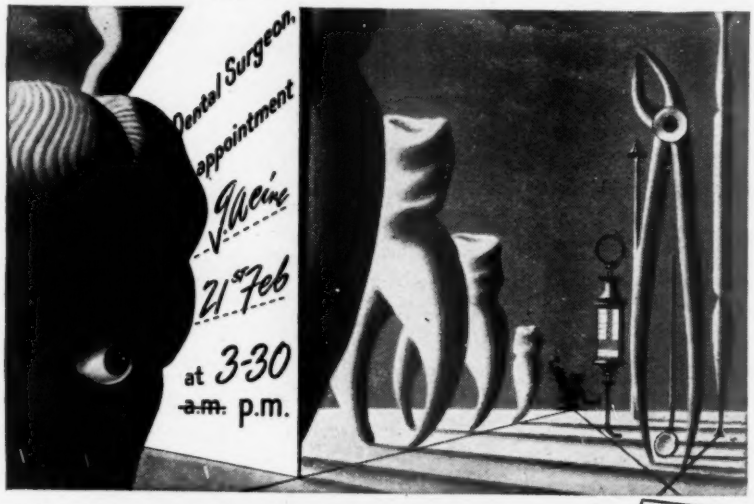

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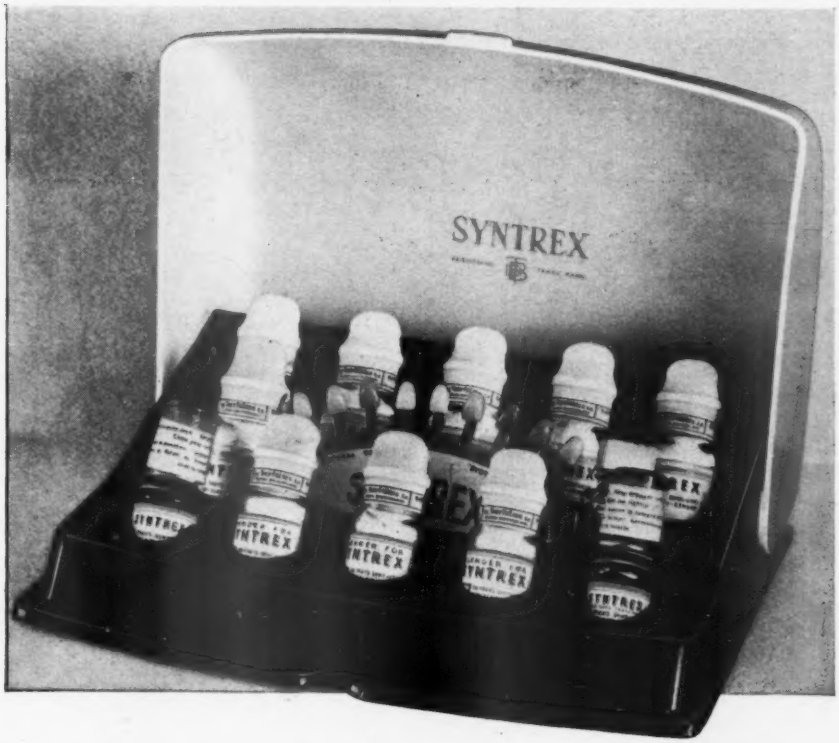

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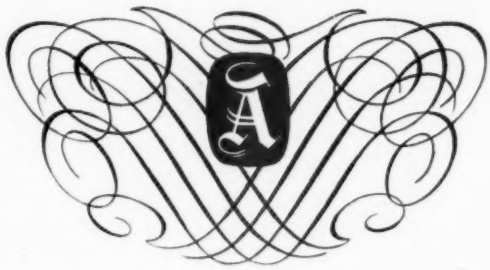

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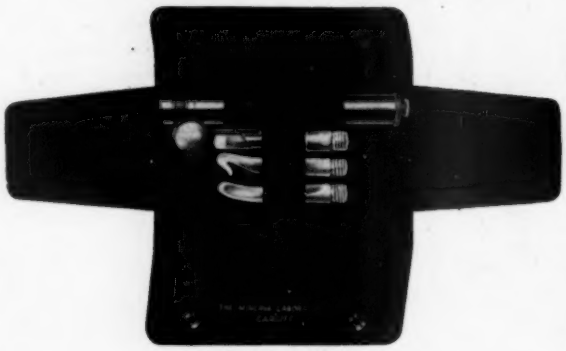

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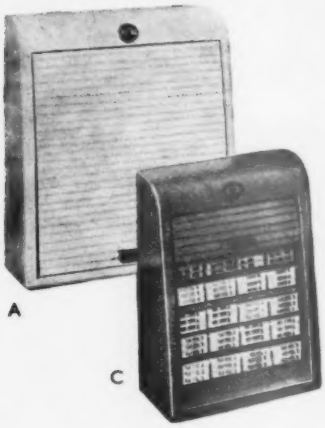
4 ASSORTMENTS



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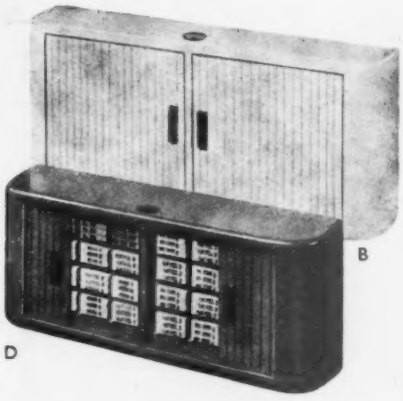

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